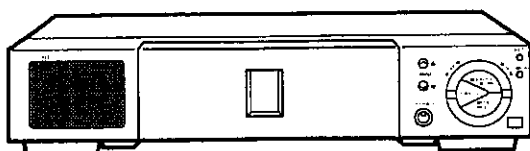


**SHARP****SERVICE MANUAL**  
**维修手册**

S76N3VC-ML3W/

**VHS VIDEO CASSETTE RECORDER****VHS 盒式磁带录象机****VC-ML3**  
**VC-ML3W****MODELS**  
**型 号**

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

为了使用者的安全 (有些国家用安全规定加以要求), 修理本装置时必须完全保持其原有配件状态, 更换只得使用规定者。

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**SHARP CORPORATION**

## PRECAUTIONS IN PART REPLACEMENT

*When servicing the unit with power on, be careful to the section marked white all over.*

*This is the primary power circuit which is live.*

When checking the soldering side in the tape travel mode, make sure first that the tape has been loaded and then turn over the PWB with due care to the primary power circuit.

Make readjustment, if needed after replacement of part, with the mechanism and its PWB in position in the main frame.

### **(1) Start and end sensors: D710 and D709**

Insert the sensor's projection deep into the upper hole of the holder (LHLDZ1962AJ00). Referring to the PWB, fix the sensors tight enough.

### **(2) Photocoupler RH-FX0004GEZZ: IC901**

Refer to the symbol on the PWB and the anode marking of the part.

### **(3) Cam switches A and B (RH-PX0253GEZZ): D714 and D713**

Adjust the notch of the part to the white marker of the symbol on the PWB. Do not allow any looseness.

### **(4) Take-up and supply sensors (RH-PX0252GEZZ): D712 and D711**

Be careful not to confuse the setting direction of the parts in reference to the symbols on the PWB. Do not allow any looseness.

### **(5) Diode bridge (RH-DX0083GEZZ): D901**

Adjust the + marking of the part to the symbol's cathode marking on the PWB.

## 零件更换时的注意事项

在需要对本录象机进行带电保养检查时，对所有注有白色标记的部分均应特加小心注意。

注有白色标记的部分为初级电源电路部分。

在进行走带状况检查调整过程中检查印刷电路板焊线面时，应先确认磁带的装挂状态符合要求，再边注意初级电源电路边翻转其印刷电路板进行检查。

如更换了零件，将盒室机构及其印刷电路板安置就位后，重新进行调整。

(1) 带头、带尾感应器：D710、D709

将两感应器的凸销分别深插于插座 (LHLDZ1962AJ00) 上面插孔之中，并相对于盒室机构分别将其紧固之。

(2) 光电耦合器 (RH-FX0004GEZZ)：IC901

参照盒室机构印刷电路板以及该部件阳极端的标记。

(3) 凸轮开关A和B (RH-PX0253GEZZ)：D714和D713

调该部件的槽口部于盒室机构印刷电路板的白色标记处。扣紧之 切勿让其产生任何松动。

(4) 卷带盘、供带盘感应器 (RH-PX0252GEZZ)：D712和D711

参照盒室机构印刷电路板上的所有标记，切勿混淆这两个感应器的设定方向。扣紧之，切勿让其产生任何松动。

(5) 二极管电桥 (RH-DX0083GEZZ)：D901

调该零件的+标记于盒室机构印刷电路板上的阴极处。

## 1. SPECIFICATIONS

Format:	VHS PAL, MESECAM, NTSC standard
Video recording system:	Two rotary head helical scan system
Video signal:	PAL/SECAM/NTSC colour or monochrome signal
Recording/playing time:	240 min. max. with SHARP E-240 tape (PAL/MESECAM: SP mode) 480 min. max. with SHARP E-240 tape (PAL/MESECAM: LP mode) 160 min. max. with SHARP T-160 tape (NTSC: SP mode) 480 min. max. with SHARP T-160 tape (NTSC: EP mode)
Tape width:	12.7mm
Tape speed:	23.39 mm/s (PAL/MESECAM: SP mode) 11.70 mm/s (PAL/MESECAM: LP Mode) 33.35 mm/s (NTSC: SP mode) 16.68 mm/s (NTSC: LP mode) 11.12 mm/s (NTSC: EP mode)
Antenna:	75 ohm unbalanced
Receiving channel:	VHF Channel E2 - S41, UHF Channel E21 - C57
RF converter output signal:	UHF Channel E30 - E39 Preset to E39 (SINGAPORE) UHF Channel E30 - E39 Preset to E36 (HONG KONG)
Power requirement:	AC110 - 240V, 50/60Hz
Power consumption:	Approx. 25W (220V/50Hz)
Operating temperature:	5°C to 40°C
Storage temperature:	-20°C to 55°C
Weight:	4.9kg
Dimensions:	430 mm (W) x 350 mm (D) x 97 mm (H)
Video	
Input:	0.5 - 2.0 Vp-p, 75 ohm
Output:	1.0 Vp-p, 75 ohm
S/N ratio:	45 dB min. (PAL-SP)
Horizontal resolution:	250 lines (PAL-SP)
Audio	
Input:	0 dBs = 0.775 Vrms
Line:	-8 dBs/47k ohm
Output:	Line: -8 dBs/1k ohm
S/N ratio:	42 dB min. (Normal)
HiFi dynamic range:	85 dB typ.
Frequency response:	80 Hz ~ 10 kHz (Normal SP) 80 Hz - 5 kHz (Normal LP/EP) 20 Hz - 20 kHz (Hi-Fi)
Accessories included:	75 ohm coaxial cable Operation manual Infrared remote control Battery AV cable

As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice.

Note: The antenna must correspond to the new standard DIN 45325 (IEC 169 - 2) for combined UHF/VHF antenna with 75 ohm connector.

## 1 规格

形式:	VHS(家庭用录象机)PAL, MESECAM, NTSC 标准型
视频记录方式:	双旋转磁头螺旋形扫描方式
视频信号:	PAL/SECAM/NTSC 制式彩色或黑白信号
记录再现时间:	夏普 E—240 录象磁带最大 240 分钟(PAL/MESECAM: SP 方式) 夏普 E—240 录象磁带最大 480 分钟(PAL/MESECAM: LP 方式) 夏普 T—160 录象磁带最大 160 分钟(NTSC: SP 方式) 夏普 T—160 录象磁带最大 480 分钟(NTSC: EP 方式)
磁带带宽:	12.7 毫米
走带速度:	23.39 毫米/秒(PAL/MESECAM: SP 方式) 11.70 毫米/秒(PAL/MESECAM: LP 方式) 33.35 毫米/秒(NTSC: SP 方式) 16.68 毫米/秒(NTSC: LP 方式) 11.12 毫米/秒(NTSC: EP 方式)
天线:	75 欧姆, 非平衡式
接收频道:	VHF(甚高频)频道 E2—S41, UHF(超高频)频道 E21—C57
射频变换器输出信号:	UHF(超高频)频道 E30—E39, 出厂预设为频道 E39(新加坡) UHF(超高频)频道 E30—E39, 出厂预设为频道 E36(香港)
电源:	交流 110—240 伏, 50/60 赫兹
消耗功率:	大约 25 瓦(220 伏/50 赫兹)
工作温度:	5℃—40℃
存放温度:	—20℃—55℃
重量:	4.8 公斤
尺寸:	430(宽)×350(深)×97(高)毫米
视频信号	
输入:	0.5—2.0V <sub>p-p</sub> , 75 欧姆
输出:	1.0V <sub>p-p</sub> , 75 欧姆
信号噪声比:	45 分贝(PAL—SP 方式)
水平清晰度:	250 线条(PAL—SP 方式)
音频信号	
输入:	线路输入: —8 分贝/47k 欧姆
输出:	线路输出: —8 分贝/1k 欧姆
信号噪声比:	42 分贝(标准型)
Hi—Fi 动态范围:	85 分贝
频率响应:	80Hz—10kHz(标准型 SP 方式) 80Hz—5kHz(标准型 LP/EP 方式) 20Hz—20kHz(Hi—Fi)
附件:	75 欧姆同轴联接电缆 使用说明书 红外线遥控器 电池 AV 电缆

由于电子产品不断更新换代,有不经预告而改变设计及其规格的情况。

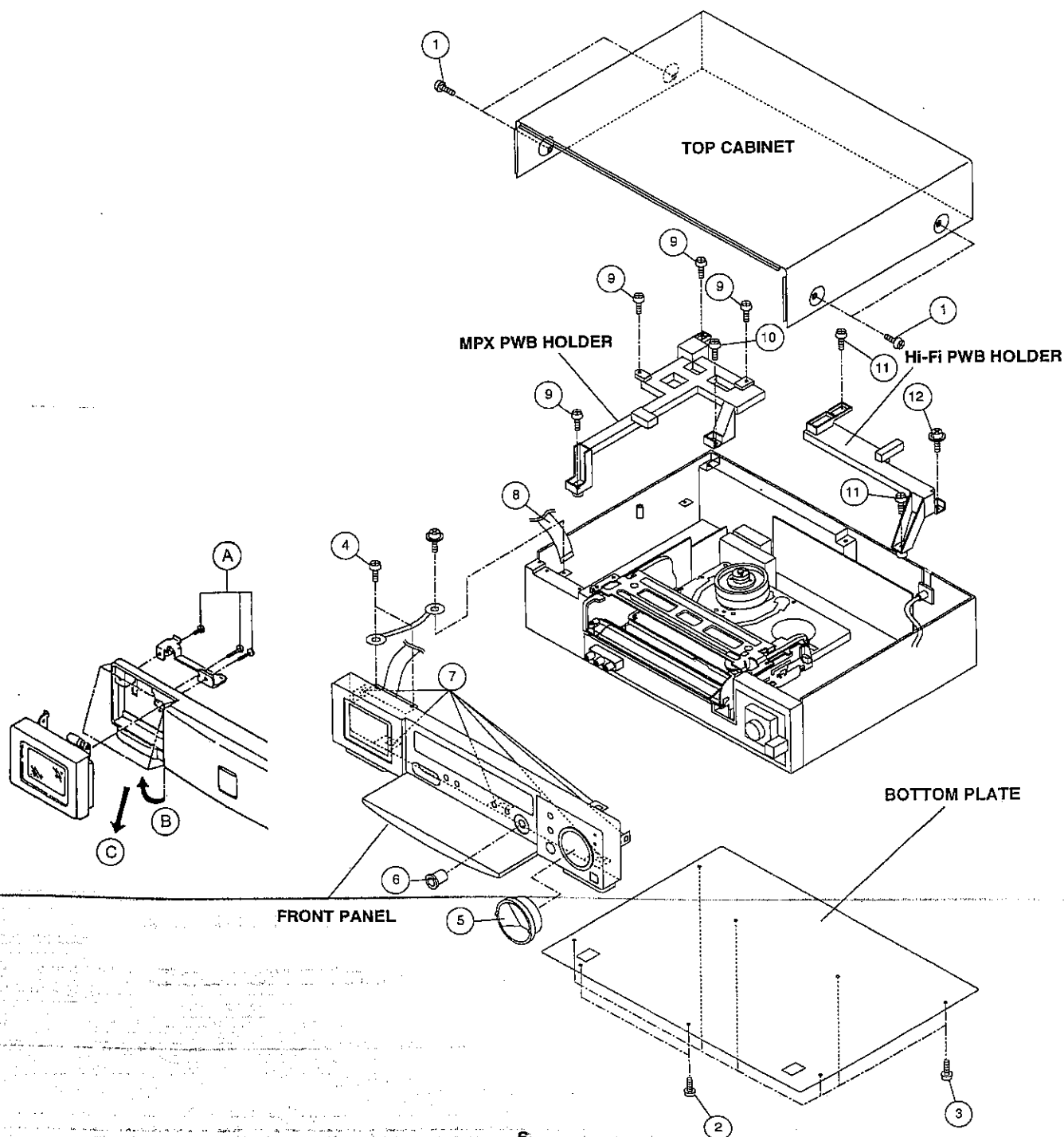
注: 天线应使用符合 DIN45325(IEC169—2)新标准的带有 75 欧姆连接器的 UHF/VHF 型天线。

## 2. DISASSEMBLY AND REASSEMBLY

### 2-1 DISASSEMBLY OF MAJOR BLOCKS

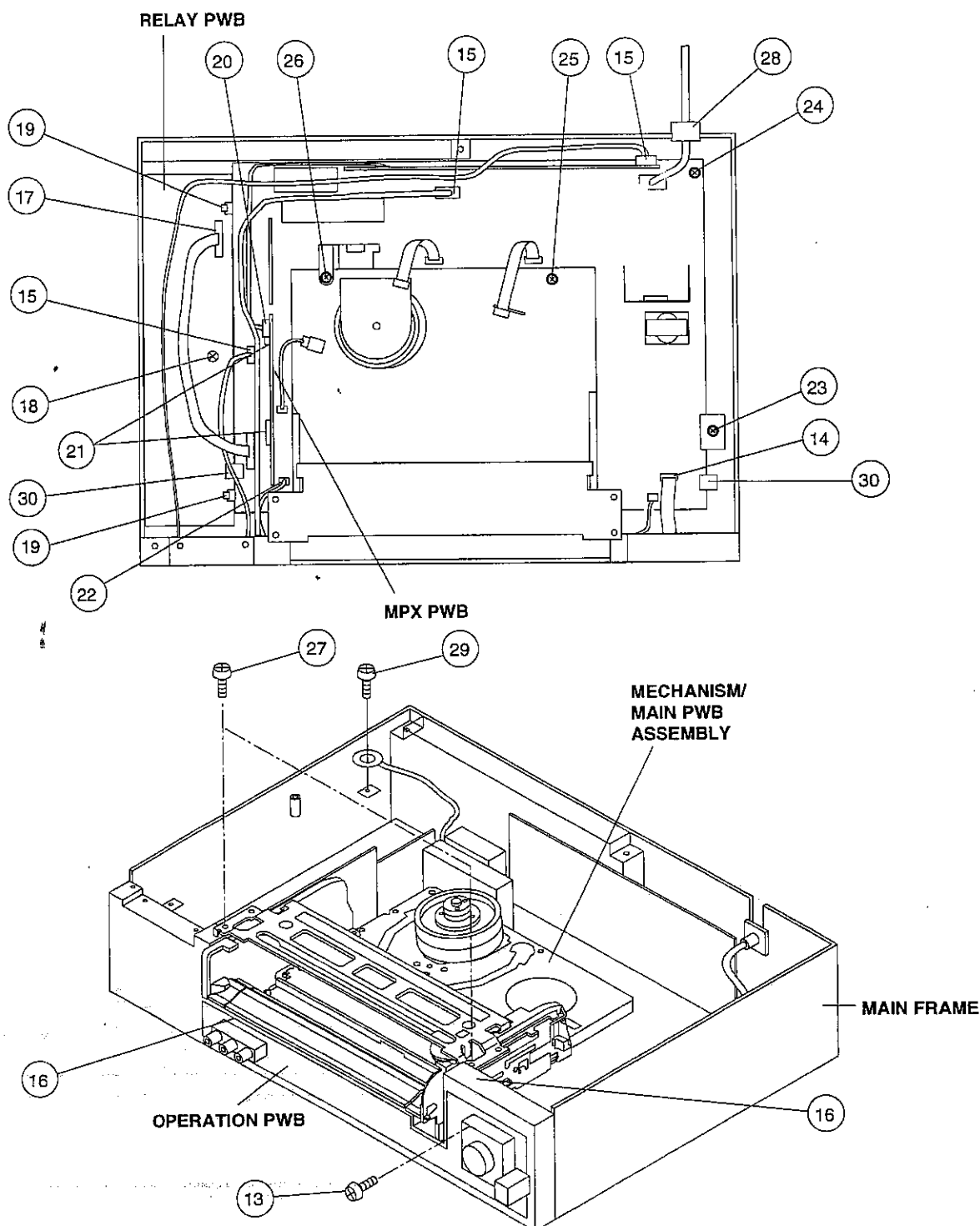
- TOP CABINET** : Remove 4 screws ①.
- BOTTOM PLATE** : Remove 2 screws ② and 6 screws ③.
- FRONT PANEL** : Remove 2 screws ④. Remove SHUTTLE switch knob ⑤ and volume knob ⑥. Remove 6 clips ⑦. Remove 1 FFC ⑧. (Note: In reconnecting the ground lead, place the washer on the angle and tighten up the screw.)

- LCD PANEL** : Remove the 3 screws ⑨. Open the bottom of the LCD panel about 25 mm ⑩ and slide it down straight about 15 mm ⑪. Now detach the panel.
- MPX PWB HOLDER** : Remove 4 screw ⑨ and 1 screw ⑩.
- Hi-Fi PWB HOLDER** : Remove 2 screws ⑪ and 1 screw ⑫.



- OPERATION PWB** : Remove 1 screw ⑬, 1 FFC ⑭, 3 connectors ⑮ and 2 hooks ⑯.
- LCD PWB** : Remove 1 connectors ⑰, 1 screw ⑱ and 2 hooks ⑲.
- MPX PWB** : Remove 1 connector ⑳ and 2 connectors ㉑.
- MECHANISM/MAIN PWB ASSEMBLY** : Remove 1 connector ㉒, 1 screw ㉓, 1 screw ㉔, 1 screw ㉕, 1 screw ㉖, 2 screws ㉗ and 1 connector ㉘.

Remove 1 screw ㉙ and earth lead. Remove 2 hooks ㉚. Lift the antenna terminal block and take the mechanism/main PWB assembly out of the main frame. Be careful not to hit the REC TIP switch located below the cassette controller.



**ANTENNA  
TERMINAL BOX  
HI-FI PWB**

**MECHANISM  
CHASSIS/  
CASSETTE  
CONTROLLER  
ASSEMBLY**

: Remove 1 screw (31).

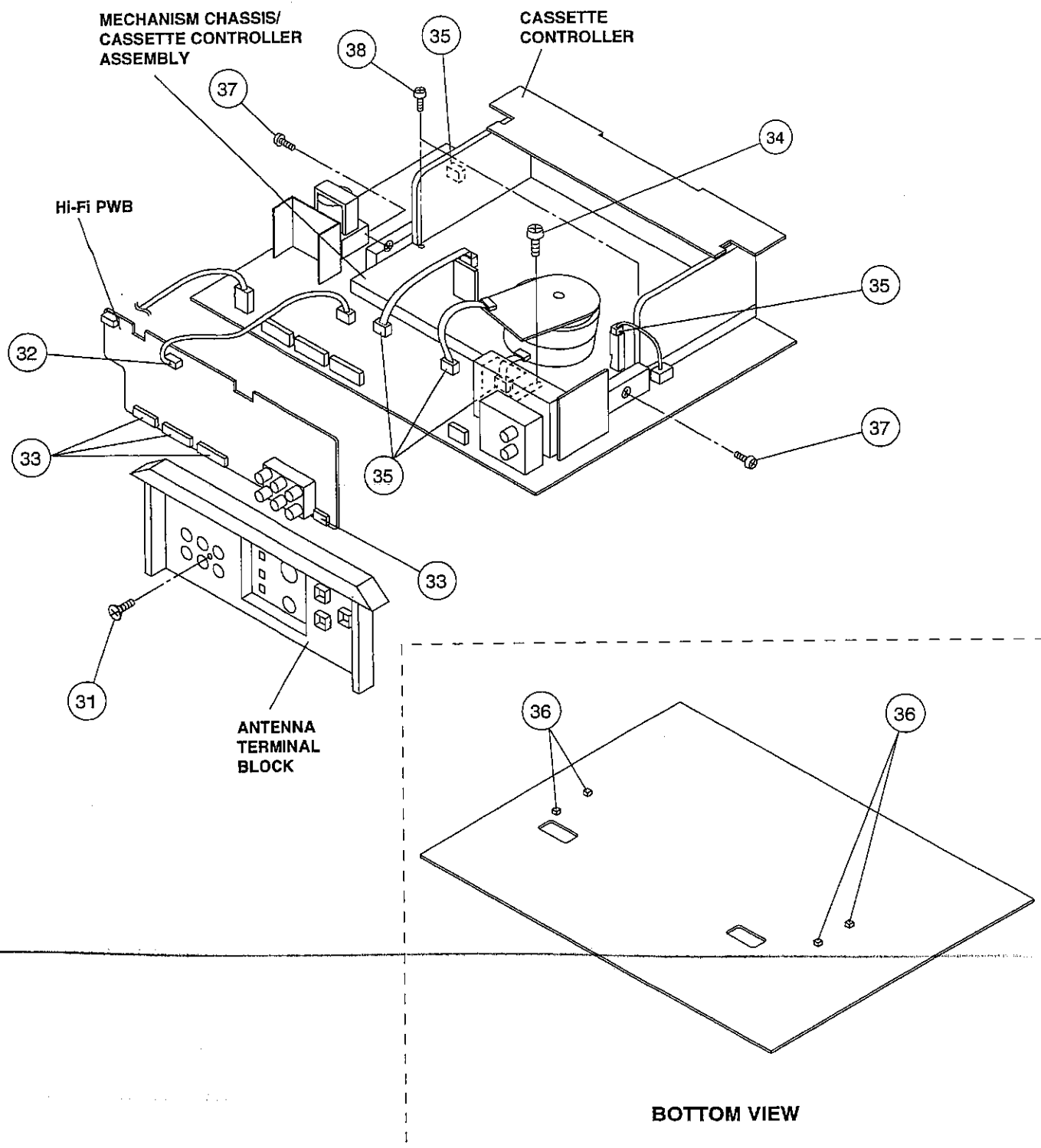
: Remove 1 connector (32) and 4 connectors (33).

: Remove 1 screw (34) and the Shield case.  
Remove 3 FFCs and 2 connectors (35). Remove 4 fooks (36) from behind the main PWB.

**CASSETTE  
CONTROLLER**

Lift the mechanism chassis/  
cassette controller assembly  
out of the main PWB. Remove  
2 screws (37).

: Remove 2 screws (38).





## 2-2 PRECAUTIONS IN REASSEMBLING

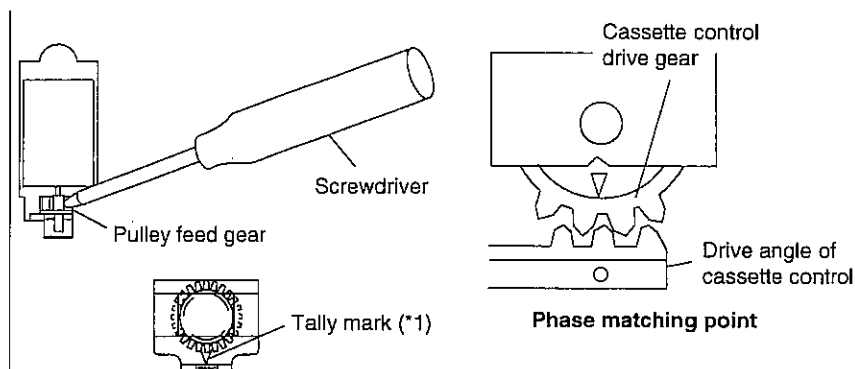
### MOUNTING THE CASSETTE CONTROLLER

Initial setting is indispensable before placing the cassette controller in the mechanism. The initial setting is made in two ways; electrical and mechanical.

#### Electrical setting:

- (1) Make a short-circuit between TP5005 and TP5006 of the TP plug (TP500\*) which is on the operation PWB.
- (2) Plug in the AC power cord and make sure the mechanism is in the initial setting position (\*1).
- (3) Unplug the AC power cord. Remove the above short-circuit.

NOTE: This method is used when the mechanism has been already set on its PWB.



#### Mechanical setting:

Turn the loading motor's pulley feed gear using a screwdriver and be sure that the mechanism is back to its initial setting position (\*1). Now place the cassette controller in position. (This method is applicable for the mechanism alone.)

### COUPLING THE MECHANISM TO THE PWB

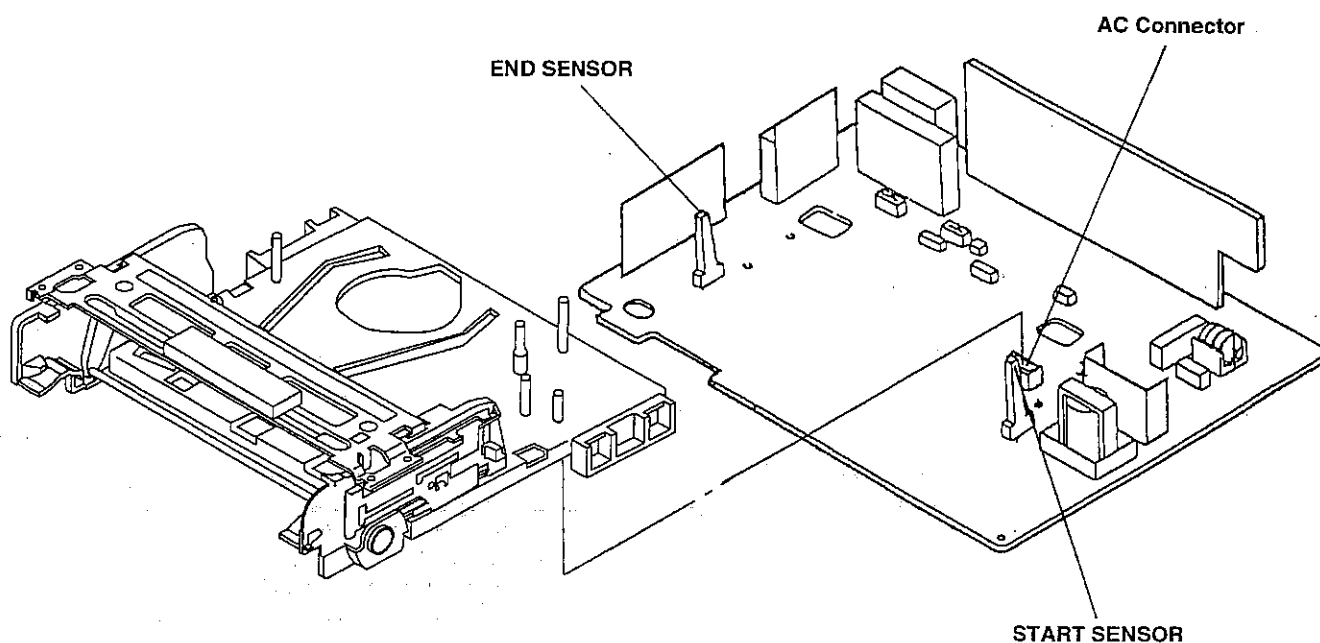
Match the mechanism's projections with the two symbols (round reference and oval sub-reference) on the main PWB. Place the mechanism straight down in position with due care so that the mechanism chassis's outer edges should not damage any parts nearby.

Tighten up the two screws (one for fixing the mechanism and the head amplifier shield, the other on the main PWB's soldering side and located near the loading motor) to fix the mechanism and main PWB. Reconnect the FFC cables (AG, AD and AH) and harnesses (AE and AL) between the mechanism and main PWB.

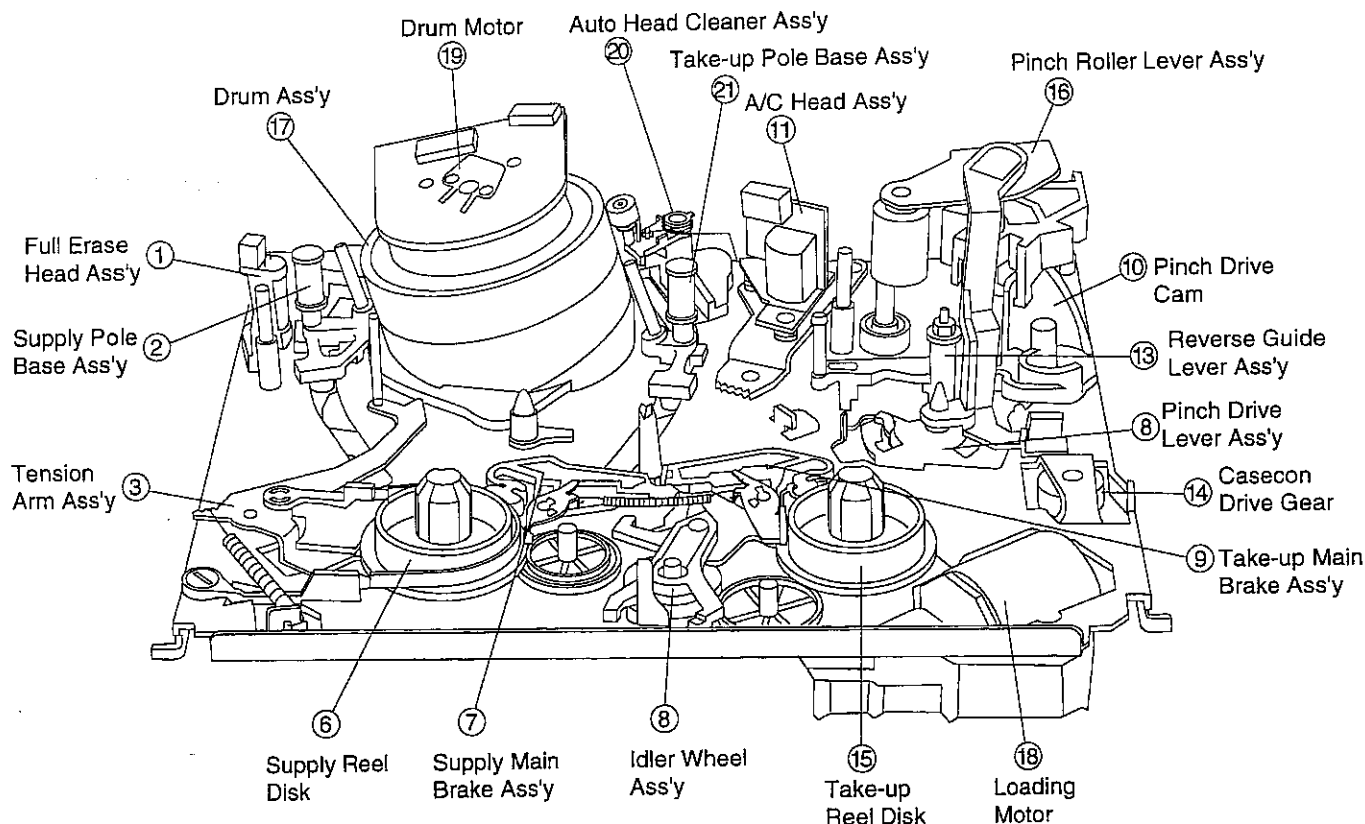
Parts to pay attention to:

- Start and end sensors D710, D709
- Record tip switch S701

Take special care of the MC-AC connector (board to board) between the mechanism and main PWB.

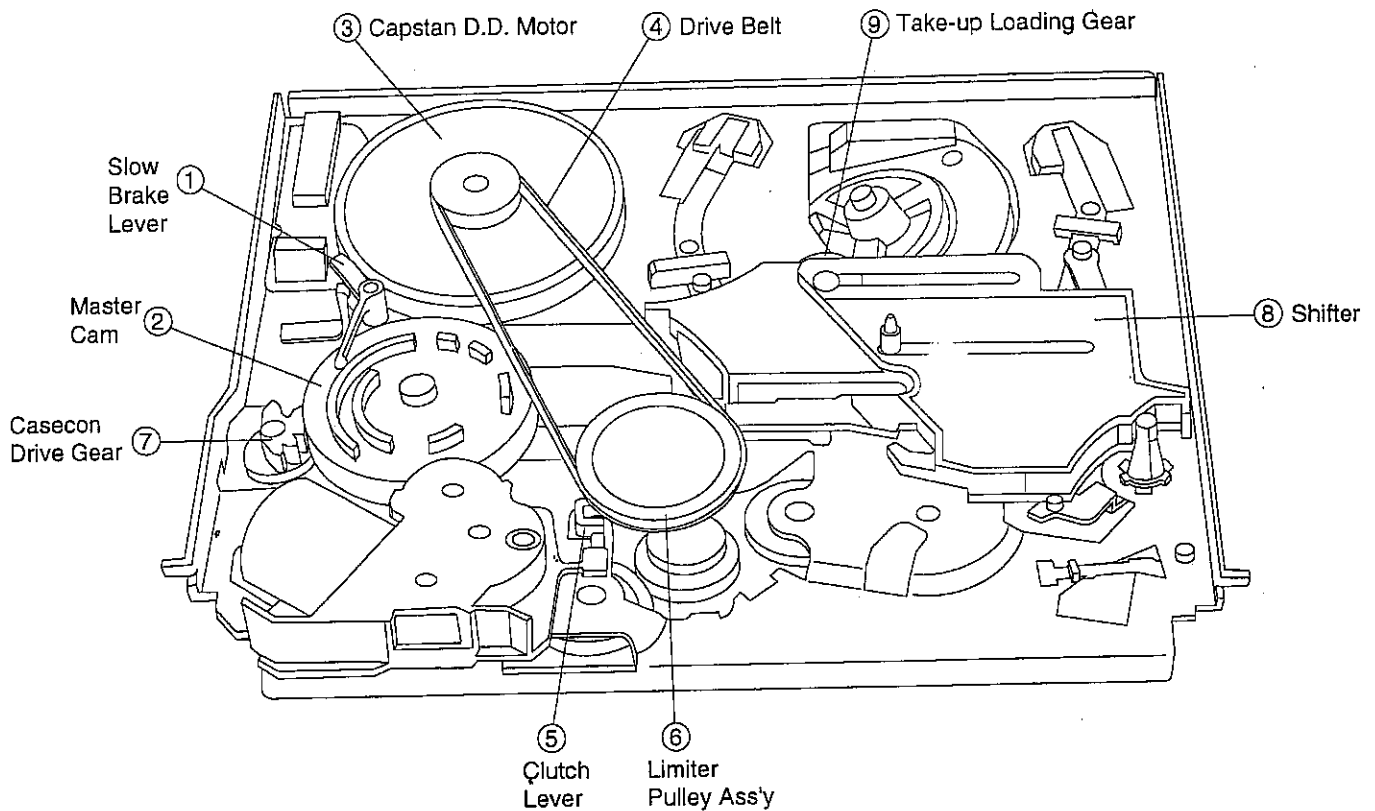


### 3. FUNCTION OF MAJOR MECHANICAL PARTS (TOP VIEW)



No.	Function	No.	Function
1.	Full erase head ass'y Erase the old recording on the tape in the recording mode.	13.	Reverse guide lever ass'y Pulls out the tape and controls the tape drive train height with the upper and lower guides.
3.	Tension arm ass'y Detects the tension of tape while running, and brakes the supply reel disk via the tension band.	16.	Pinch roller lever ass'y Press-fits the tape to the capstan during tape running.
7.	Supply main brake ass'y Brakes the supply reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.	18.	Loading motor A motive power which drives the mechanism. It transmits the power to the master cam and cassette housing control assembly.
9.	Take-up main brake ass'y Brakes the take-up reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.		

(BOTTOM VIEW)



No.	Function	No.	Function
1.	Slow brake lever Gets in contact with the capstan D.D. motor linking to the master cam in the slow still mode, and brakes it to a certain degree.	6.	Limiter pulley ass'y Transmits the power of the capstan D.D. motor to the reel disk via the drive idler.
3.	Capstan D.D. motor A motive power which runs the tape. It transmits the power via the Drive belt.	8.	Shifter Transmits the operation of the master cam to break ass'y, loading gear, tension arm and clutch lever.
4.	Drive belt Transmits the power to run the tape to the Limiter pulley.	9.	Take-up loading gear Shifts the take-up pole base and guide roller via the loading gear T, and applies the tape around the drum assembly, as well as transmits the power to the loading gears.

## 4. ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS







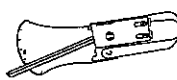
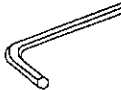

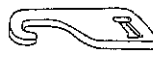
Here we will describe a relatively simple service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly replacement, for exam-

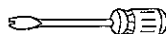

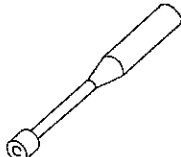

ple).

We are sure that the easy-to-handle tools listed below would be more than handy for periodical maintenance to keep the machine in its original working condition.

### TOOLS NECESSARY FOR ADJUSTING THE MECHANICAL UNITS

The following tools are required for proper service and satisfactory repair.

No.	Jig Item	Part No.	Code	Configuration	Remarks
1	Reel Disk Height Adjusting Jig	JiGRH0002	BR		These Jigs are used for checking and adjusting the reel disk height.
2	Master Plane Jig	JIGMP0001	BY		
3	A/C Head Tilt Adjusting Jig	9DAACH-A323U	BX		This Jig is used for setting the A/C head tilt.
4	Torque Gauge (90g)	JiGTG0090	CM		These Jigs are used for checking and adjusting the torque of take-up and supply reel disks.
	Torque Gauge (1.2kg)	JiGTG1200	CN		
5	Gauge Head	JiGTH0006	AW		
6	Cassette Torque Meter	JiGVHT-063	CZ		This cassette torque meter is used for checking and adjusting the torque of take-up for measuring tape back tension.
7	Tension Gauge (300g)	JiGSG0300	BF		There are two gauges used for the tension measurements, 300 g and 2.0kg.
	Tension Gauge (2.0kg)	JiGSG2000	BS		
8	Hex Wrench (0.9mm)	JiGHW0009	AE		These Jigs are used for loosening or tightening special hexagon type screws.
	Hex Wrench (1.2mm)	JiGHW0012	AE		
	Hex Wrench (1.5mm)	JiGHW0015	AE		
9	Alignment Tape (NTSC)	VROATSV	CD		These tapes are especially used for electrical fine adjustment.
	Alignment Tape (PAL)	VROCPSV	CK		
	Hi-Fi Alignment Tape	VROCBFFS	CB		
	Alignment Tape	VROCPZJS	CA		
11	Tension Gauge Adapter	JIGADP003	BK		This Jig is used with the tension gauge. Rotary transformer clearance adjusting jig.

No.	Jig Item	Part No.	Code	Configuration	Remarks
12	Special Bladed Screwdriver	JIGDRIVERH-4	AP		This screwdriver is used for adjusting the guide roller height.
14	Torque Driver	JIGTD1200	CB		This is used to screw down resinmade parts: the specified torque is 5kg.
15	Box Driver	JIGDRIVER110-7	AS		This Jig is used for height adjustment of the A/C head and X-position.
		JIGDRIVER110-4	AV		This Jig is used for replacement of the SI roller.
		JIGDRIVER110-55	AR		This Jig is used for replacement of the reverse guide.
16	Reverse Guide Height Adjusting Jig	JIGRVGH-F18	BU		This Jig is used for height adjustment of the reverse guide.

## MECHANICAL PARTS REQUIRING PERIODICAL INSPECTION

Use the following table as a guide to maintain the mechanical parts in good operating condition.

Parts	Maintained	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	Possible symptom encountered	Remarks
Guide roller ass'y		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Lateral noises Head occasionally blocked	Abnormal rotation or significant vibration requires replacement.
Supply impedance roller		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>		Clean with pure high quality isopropyl alcohol.
Supply impedance roller (inner hole and shaft)			<input type="checkbox"/>		<input type="checkbox"/>		Clean tape contact part with the specified cleaning liquid.
Supply impedance roller flange		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Retaining guide		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Slant pole		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>		
Upper and Lower drum ass'y		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Poor S/N ratio, no colour Poor flatness of the envelope with alignment tape	Clean tape contact area with the specified cleaning liquid.
Full-erase head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Poor colour, beating	
A/C head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Sound too small or distorted	
Capstan D.D. Motor		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	No tape running, uneven colour	
Pinch roller		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	No tape running, tape slack	Clean rubber and rubber contact area with the specified cleaning liquid.
Reel belt			<input type="checkbox"/>		<input type="radio"/>	No tape running, tape slack, no fast forward/rewind motion	
Tension band ass'y					<input type="radio"/>	Cassette not loaded or unloaded	
Loading Motor					<input type="radio"/>		
Reel idler ass'y					<input type="radio"/>	No tape running	
Reel pully ass'y			<input type="checkbox"/>		<input type="checkbox"/>		
Clutch gear ass'y					<input type="radio"/>		
Main supply/take-up brake levers					<input type="radio"/>	Tape slack	
AHC (Automatic Head Cleaner)			<input type="radio"/>		<input type="radio"/>		Replace the roller of the cleaner when it wears down. Just change the AHC roller assembly for new one.

**NOTE:** ○ : Part replacement.  
☐ : Cleaning (For cleaning, use a lint-free cloth dampened with pure isopropyl alcohol).  
☐ : Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000hrs).

If the reading is out of the specified value, clean or replace the part.

## REMOVAL AND REASSEMBLY OF CASSETTE HOUSING CONTROL ASSEMBLY

### • Removal

1. Set the cassette ejected condition in the cassette eject mode.
2. Unplug the recorder from the main source.
3. Follow the procedures below in the specified order.
  - a) Remove the cassette housing installation screws ①.
  - b) Slide and pull out the cassette housing control assembly upward.

### • Reassembly

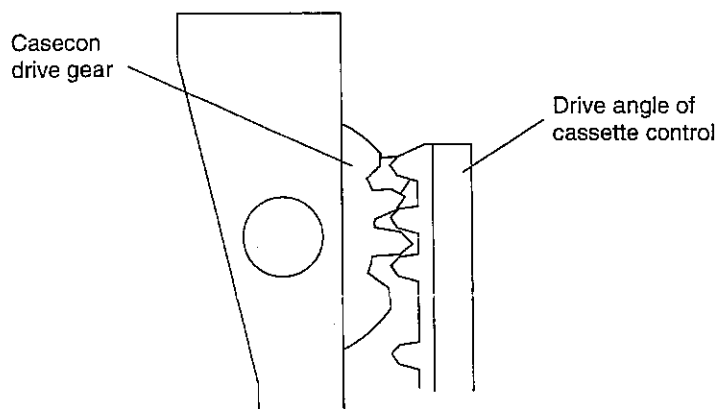


Figure 4-2.

### Notes:

- ① In using a magnet screw driver, be sure to keep it away from the A/C head, FE (Full Erase) head, and the drum.
- ② In removal and reassembly, take care not to hit the cassette housing control assembly and tools against the guide pin, drum, or the like there about.
- ③ Load the cassette once onto the cassette housing control assembly after reassembly.

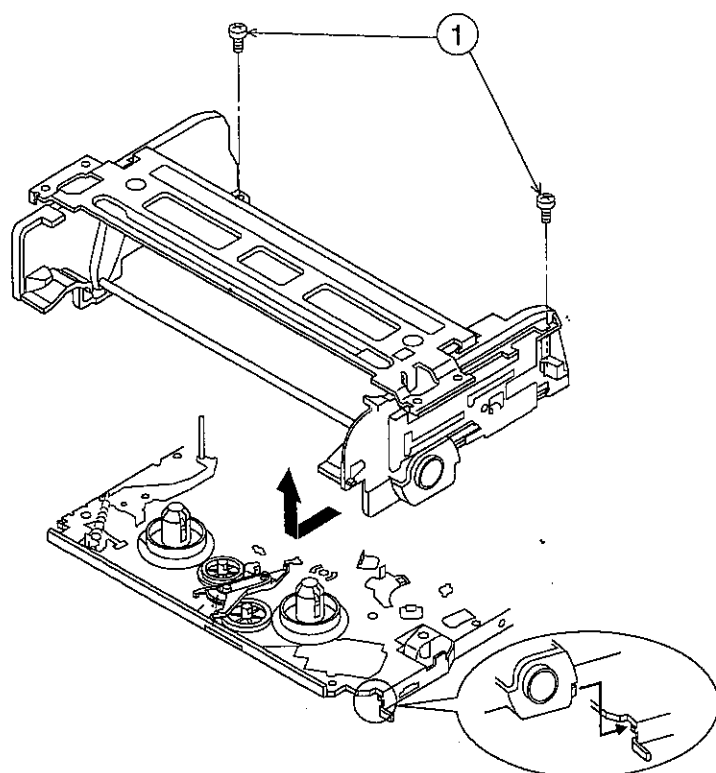


Figure 4-1.

## TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Be sure to make a short-circuit between TP5005 and TP5006, both located on the operation PWB before turning on the power.
2. Plug in the power cord.
3. Turn on the power switch.
4. Open the lid of a cassette tape by hand.
5. Hold the lid with two pieces of vinyl tape.
6. Set the cassette tape in the mechanism chassis.
7. Stabilize the cassette tape with a weight (500g) to prevent floating.
8. Perform running test.

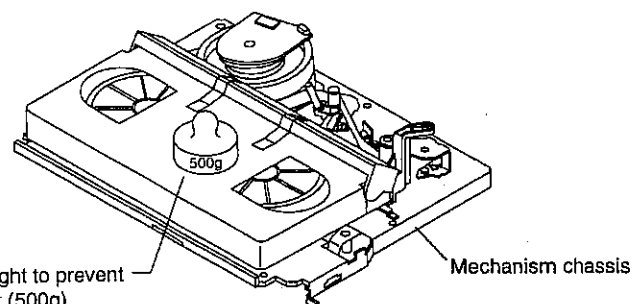


Figure 4-3.

1. Before installation of the cassette housing control assembly, make a short-circuit between TP5005 and TP5006, both located on the operation PWB. Plug in the power cord. The cassette control drive gear starts and stops just when the big face gear shows in the mechanism chassis window. Engage the tooth 2 of the casecon drive gear with the tooth 3 of the cassette control drive angle as shown in Fig. 4-2, to position the cassette control on the mechanism chassis.
2. Follow the procedures for removal in the reverse order.

### Note:

The weight should not be more than 500g.

## REPLACEMENT AND HEIGHT CHECKING AND ADJUSTMENT OF REEL DISKS

### • Removal (Supply and Take-up reel disks)

1. Remove the cassette housing control assembly.
2. Pull the tension band out of the tension arm.
3. Release the supply/take-up auxiliary brake lever by hand, which makes unnecessary removal of the supply main brake and the take-up main brake.
4. Open the hook at the top of the reel disk, and remove the reel disk.

<In the EJECT or UL STOP mode>

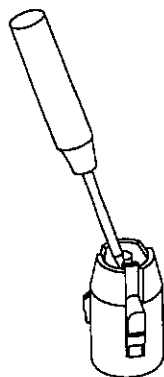
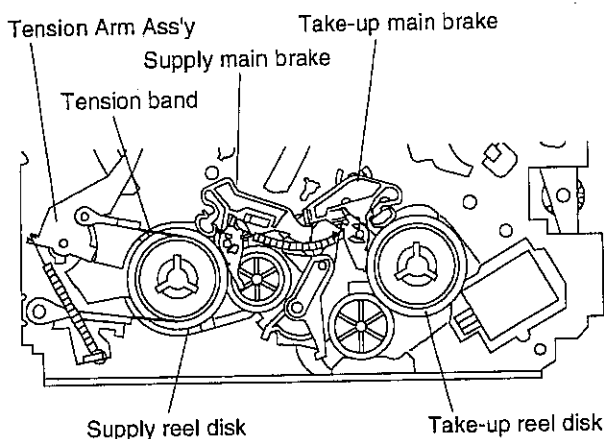


Figure 4-4.

### • Reassembly (Supply reel disk)

1. Clean the reel disk shaft and apply oil to it.
2. Align the phase of the reel disk to that of the reel relay gear, and install a new supply reel disk onto the shaft.
3. Replace the tension band around the supply reel disk, and insert it into the hole of the tension arm with the supply auxiliary brake lever released.
4. Check the reel disk height.

#### Notes:

- ① Take enough care not to deform the tension band during installation of the supply reel disk.
- ② Be careful not to damage the supply main brake and the reel relay gear.

### • Reassembly (Take-up reel disk)

1. Clean the reel disk shaft and apply oil to it.
2. Release the take-up auxiliary brake lever to align the phase of the reel disk to that of the reel relay gear and to install a new take-up reel disk onto the shaft.
3. Check the reel disk height and reassemble the take-up main brake.

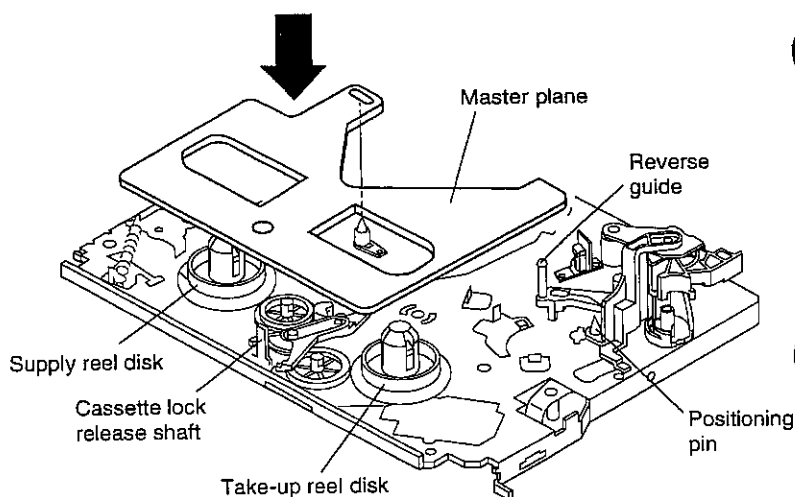
#### Note:

- Take care not to damage the take-up main brake.
- \* After reassembly, check the video search rewind back tension (see page 19), and check the brake torque (see page 21).

### • Height checking and adjustment

#### Note:

Place the master plane onto the mechanism unit, taking care not to hit the drum (see Figure 4-6).



Set the master plane releasing the reverse guide by a finger.

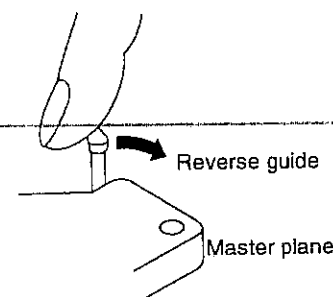


Figure 4-6.

#### Note:

When the tension band is pressed in the direction of the arrow for removal, the catch is hard to be deformed.

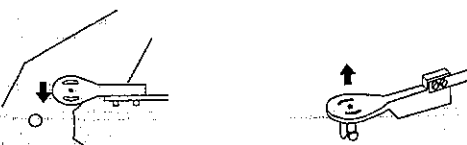


Figure 4-5.



- Check that the reel disk is lower than part A but higher than part B. If the height is not correct, readjust the reel disk height by changing the poly-slider washer under the reel disk.

**Note:**

Whenever replacing the reel disk, perform the height checking and adjustment.

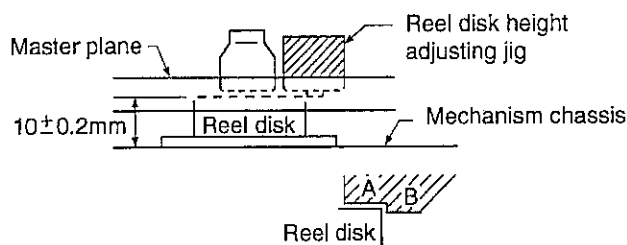


Figure 4-7.

## CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST FORWARD MODE

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located on the operation PWB. Now turn on the power.

**Setting**

1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
2. Press the FF button to set the mechanism to the fast forward mode.
3. To calculate the remaining capacity of the play back mode, slowly rotate the supply reel disk, and then shift it into the forward mode.

**Checking**

1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction.
2. Check to see if the take-up torque is higher than 69 mN·m (700 gf·cm).

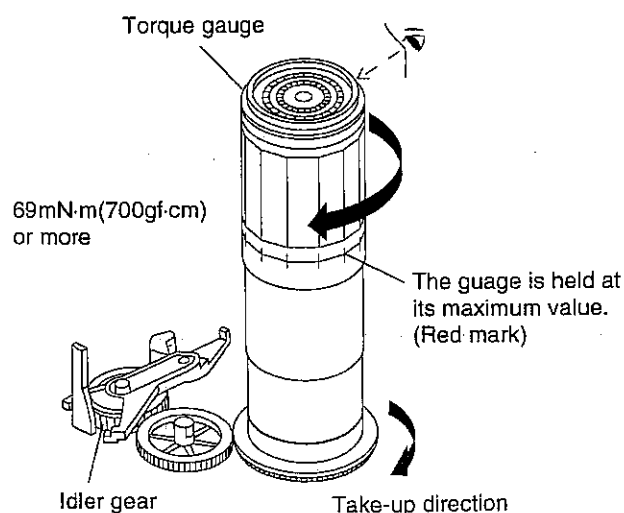


Figure 4-8.

**Adjustment**

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, drive belt and limiter pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the drive belt.

**Notes:**

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

## CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located on the operation PWB. Now turn on the power.

**Setting**

1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
2. Press the REW button to set the mechanism to the rewind mode.
3. To calculate the remaining capacity, slowly rotate the take-up reel disk, and then shift it into the rewind mode.

**Checking**

1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction.
2. Check to see if the take-up torque is higher than 69 mN·m (700 gf·cm).

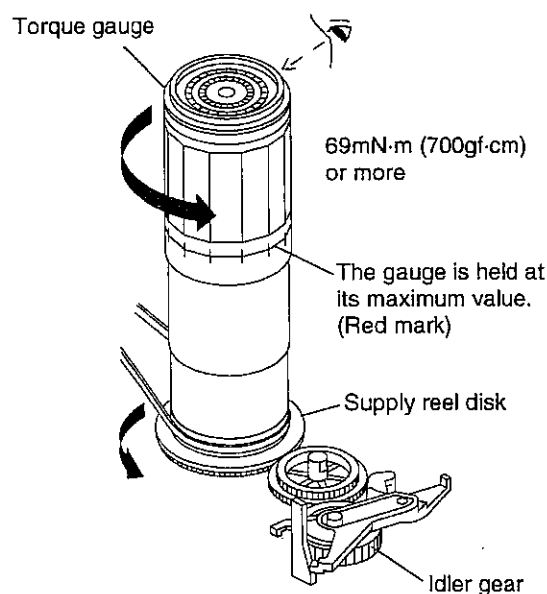


Figure 4-9.

**VC-ML3  
VC-ML3W**

• **Adjustment**

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, drive belt and limiter pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the drive belt.

**Notes:**

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

## CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN PLAYBACK MODE

1. Remove the cassette housing control assembly.
2. Make a short-circuit between TP5005 and TP5006, both located on the operation PWB. Now turn on the power.
3. Open the lid of the cassette torque meter, and hold it with two pieces of vinyl tapes.
4. Load the cassette torque meter into the unit.

Set value LP  $10.5 \pm 3.8\text{mN}\cdot\text{m}$  ( $107 \pm 39\text{gf}\cdot\text{cm}$ )

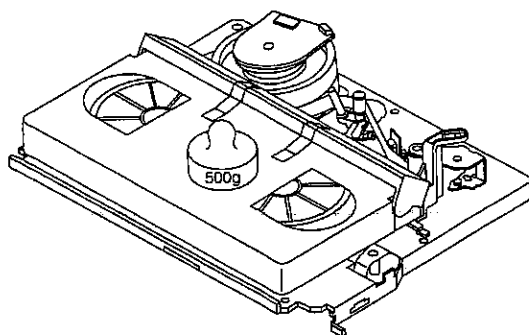


Figure 4-10.

## CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- Remove the cassette housing control assembly.

- Make a short-circuit between TP5005 and TP5006, both located on the operation PWB. Now turn on the power.

• **Setting**

1. Push the PLAY button to place the ass'y in the playback mode.
2. Push the REW button to place the ass'y in the video search rewind mode.

• **Checking**

1. Place the torque gauge on the supply reel disk, and turn it counterclockwise very slowly (one rotation every 1 to 2 seconds) and check that the torque is within the set value  $14.0 \pm 3.9\text{mN}\cdot\text{m}$  ( $144 \pm 40\text{gf}\cdot\text{cm}$ ).

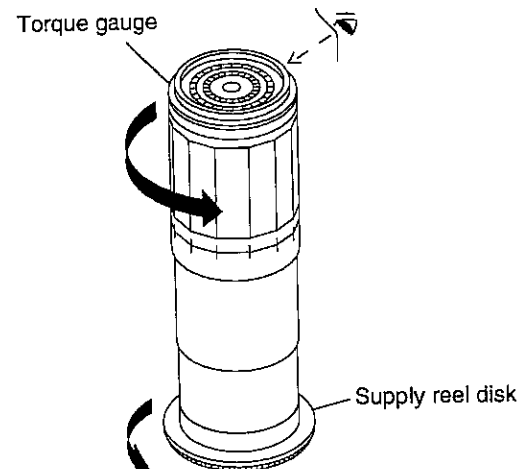


Figure 4-11.

5. Put the weight (500g) on the cassette torque meter.
  6. Press the REC button to put the unit in REC mode.
- **Checking**
1. Check that the torque is in the range of  $10.5 \pm 3.8\text{mN}\cdot\text{m}$  ( $107 \pm 39\text{gf}\cdot\text{cm}$ ).
  2. The torque fluctuates due to the rotational deviation of the limiter pulley ass'y. Use the center of the fluctuation as the value.
  3. Place the ass'y in the LP record mode, and check that the take-up torque is within the range.

• **Adjustment**

If the take-up torque in the playback mode is outside the range, replace the limiter pulley ass'y.

**Note:**

Stabilize the cassette torque meter to prevent floating.

**Note:**

Set the torque gauge securely on the supply reel disk. If it is not secure, the measurement will be incorrect.

• **Adjustment**

If the take-up torque in video search rewind mode is outside the range, replace the limiter pulley ass'y.

**Note:**

The torque fluctuates due to the rotational deviation of the limiter pulley ass'y. Use the center of the fluctuation at the value.

## CHECKING THE VIDEO SEARCH REWIND BACK TENSION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located on the operation PWB. Now turn on the power.
- **Checking**
  1. Push the PLAY button to place the ass'y in the playback mode.
  2. Push the rewind button to place the ass'y in the video search rewind mode.
  3. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value  $2.7 \pm 1 \text{ mN}\cdot\text{m}$  ( $28 \pm 10 \text{ gf}\cdot\text{cm}$ ).

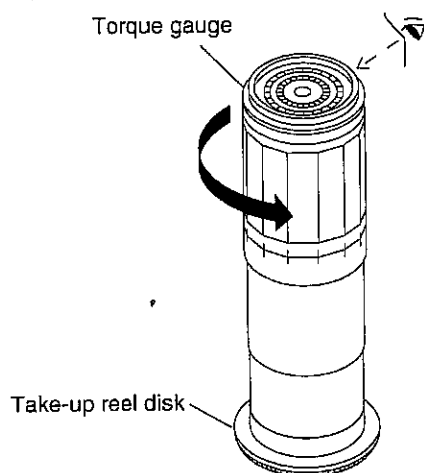


Figure 4-12.

### Notes:

1. Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.
2. Measure the torque applying the torque gauge's weight.

## CHECKING THE PINCH ROLLER PRESSURE

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located on the operation PWB. Now turn on the power.
- **Checking**  
Push the PLAY button to place the ass'y in the playback mode.

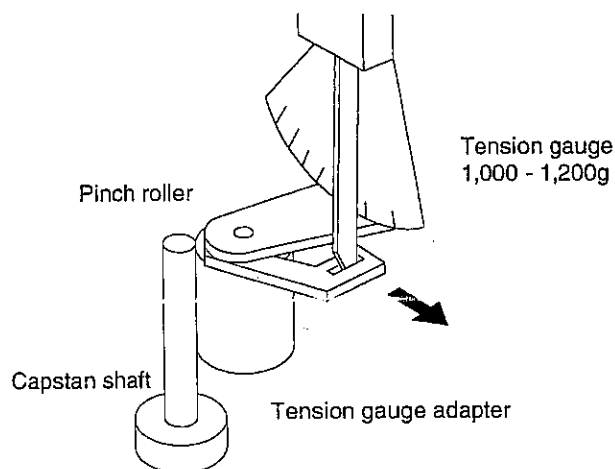


Figure 4-13.

1. Detach the pinch roller from the capstan shaft.
2. Set the tension gauge by hooking the tension gauge adapter onto the pinch roller shaft.
3. Gradually release the pressure to allow the pinch roller to touch the capstan shaft. When the pinch roller just touches the capstan shaft, read the indication on the gauge.
4. Check that the reading of the tension gauge is in the range of 900 to 1200 g.

## CHECKING AND ADJUSTMENT OF TENSION POLE POSITION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located on the operation PWB. Now turn on the power.
- **Setting**
  1. Open the lid of cassette tape (E-180), and hold it with two pieces of vinyl tapes.
  2. Load the cassette tape into the unit.
  3. Put the weight (500g) on the cassette tape.
  4. Make the adjustment with the beginning of a E-180 tape.

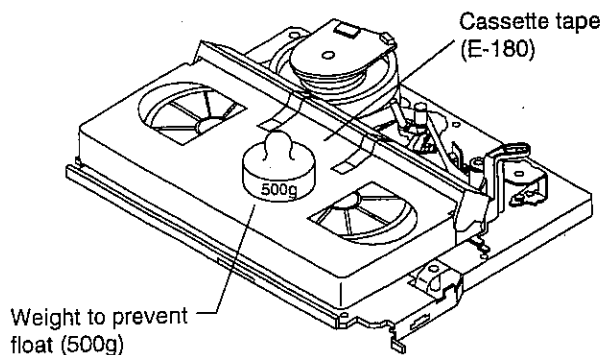


Figure 4-14.

- **Checking**
  1. Set a cassette tape, press the REC button and get the tape loaded. Now check the tension pole position.

- **Adjustment**

1. If the reading of the cassette torque meter is less than specified, move the tension spring hook toward A.
2. If the reading of the cassette torque meter is more than specified, move the tension spring hook toward B.

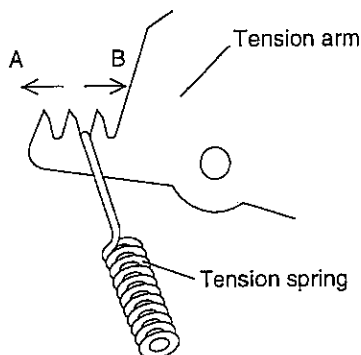
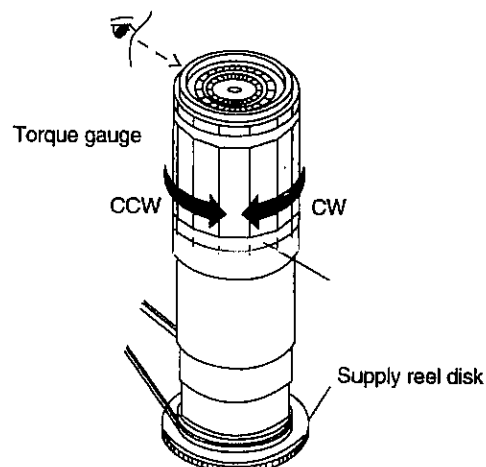


Figure 4-20.

## CHECKING THE BRAKE TORQUE

- **Checking the brake torque at the supply side**



CCW:	5.9~9.8mN·m (60~100gf·cm)
CW:	10~32mN·m (100~330gf·cm)

Figure 4-21.

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5005 and TP5006, both located on the operation PWB. Now turn on the power.**
- **Setting**
  1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
  2. Switch from the FF mode to the STOP mode.
  3. Disconnect the AC power plug.
- **Checking**
  1. Rotate the torque gauge (approx. one revolution per 2 seconds) in the clockwise (CW) direction and counterclockwise (CCW) direction of the supply brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CW direction = 10 ~32mN·m (100~330gf·cm), CCW direction = 5.9~9.8mN·m (60 ~100gf·cm), and that the brake torque in the CW direction is at least twice as high as that in the CCW direction.

- Checking the brake torque at the take-up side

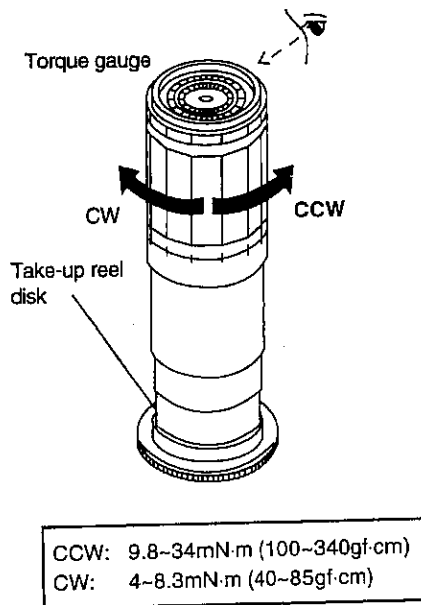


Figure 4-22.

- Remove the cassette housing control assembly.

- Make a short-circuit between TP5005 and TP5006, both located on the operation PWB. Now turn on the power.

#### • Setting

1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
2. Switch from the FF mode to the STOP mode.
3. Disconnect the AC power plug.

#### • Checking

1. Rotate the torque gauge (approx. one revolution per 2 seconds) in the clockwise (CW) direction and counterclockwise (CCW) direction of the take-up brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CCW direction = 9.8~34mN·m (100~340gf·cm), CW direction = 4~8.3mN·m (40~85gf·cm), and that the brake torque in the CCW direction is at least twice as high as that in the CW direction.

#### • Adjustment of the brake torque at the supply side and the take-up side

1. If the supply or take-up brake torque is outside the range, clean the supply or take-up reel disk brake lever pad, then recheck the torque.
2. If the supply or take-up brake torque is still outside the range, replace the main brake ass'y.

#### Note:

When the main brake is replaced, perform the height checking and adjustment of reel disks (see page 16), and the brake torque checking.

## REPLACEMENT OF A/C (Audio/Control) HEAD

1. Remove the cassette housing control assembly.
2. Place the unit in the unloading mode, and unplug the power cord.

#### • Removal

1. Remove the screw (A)(B)(C)(1)(2).
2. Unsolder the A/C head PWB soldered to the A/C head assembly.

#### Notes:

1. After replacement, be sure to perform the adjustment of the tape drive train (see page 24). Under any circumstances, avoid touching the head. Clean the head, if touched with your finger, with alcohol.
2. Take care that the springs do not fly off when removing the screws (A)(B)(C).

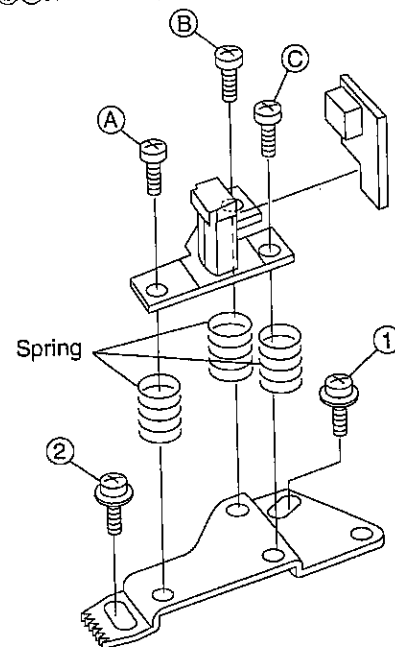


Figure 4-23.

#### • Replacement

1. Solder the removed A/C head PWB onto a new A/C head assembly.
2. Using the slide calipers, set 10.3 mm for the height of the A/C head arm (bottom surface) to the A/C head plate (screw area). (3 places)  
(See the figure below.)

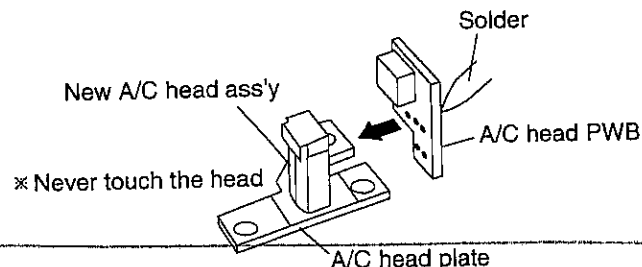


Figure 4-24.

3. Align the left end of the gear of the A/C head arm to the mark on the chassis, and temporarily tighten the screws ① and ② to allow the A/C head arm to smoothly move.  
(Reference: Temporary tightening torque: 0.2 N.m as preferable)

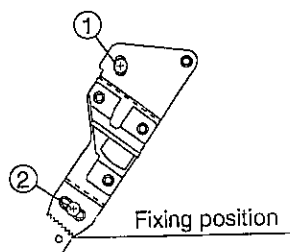


Figure 4-25.

**Note:**

Take care that the adjustment or height of the A/C head may vary during final tightening if the screws ① or ② is temporarily tightened to be loose.

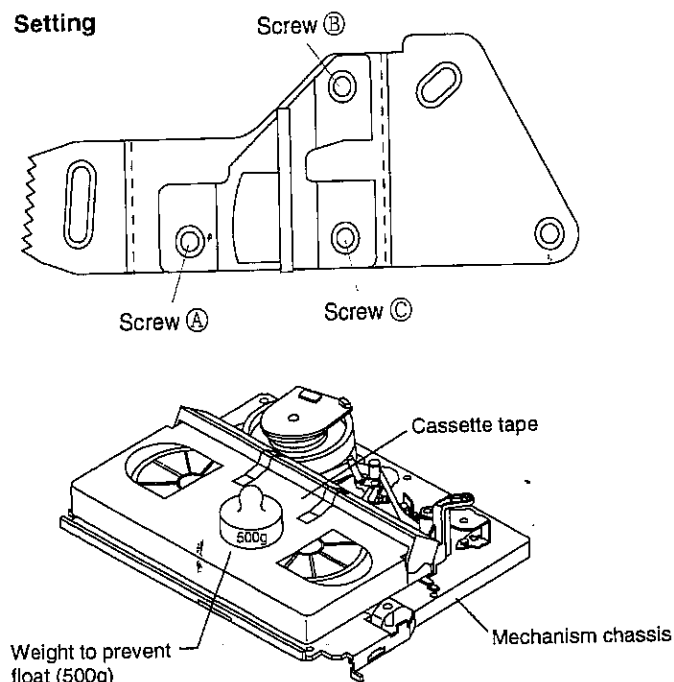
**[A/C head height rough adjustment]****• Setting**

Figure 4-26.

- ① Set the cassette tape to the mechanism chassis.
- ② Press the PLAY button to put the unit in the playback mode.
- ③ Roughly adjust the height of the A/C head by turning the screw ③ until the tape is in the position shown below.

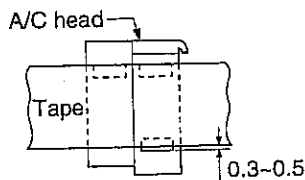


Figure 4-27.

**• Adjustment**

Adjust the screw ③ visually so that the control head is visible 0.3 to 0.5 mm below the bottom of the tape.

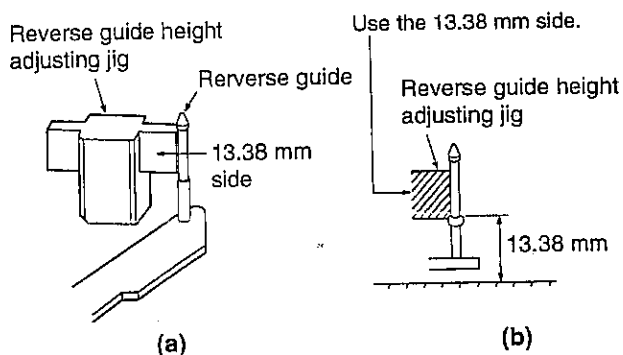
**HEIGHT ADJUSTMENT OF REVERSE GUIDE****[Height adjustment of reverse guide]**

Figure 4-28.

- ① Remove open lever (Figure 4-29 (a)).
- ② In the tape load mode, make adjustment at the 13.38 mm side first and then rotate the reverse guide adjuster nut by 1/10 turn counterclockwise.
- ③ Actually load the unit with a tape, put it in the play mode, and make sure the tape is free from wrinkles near the reverse guide.
- ④ Use a commercially available box driver to turn the height adjusting nut.

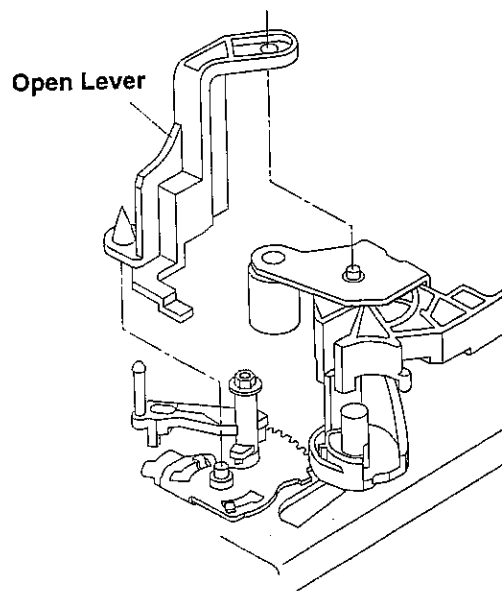


Figure 4-29 (a).

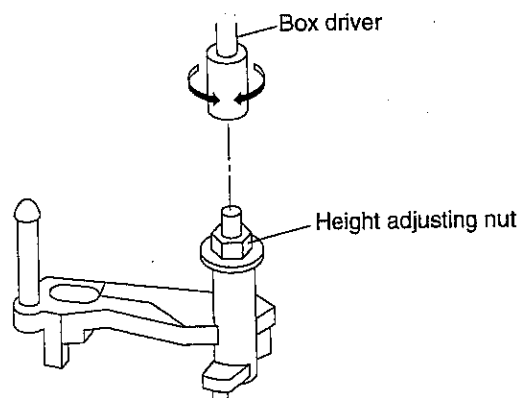


Figure 4-29 (b).

## ADJUSTMENT OF TAPE DRIVE TRAIN

1. Remove the cassette housing control assembly.
2. Make a short-circuit between TP5005 and TP5006, both located on the operation PWB. Now turn on the power.
3. Check and adjust the position of the tension pole. (See page 19.)
4. Check and adjust the video search rewind back tension. (See page 19.)
5. Set the A/C head. (See page 22.)
6. Rough adjustment of tape drive train.
  - a) Connect the oscilloscope to the test point for PB CHROMA envelope output (TP501). Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP502).
  - b) Loosen the setscrew at the lower part of the guide roller, and adjust it with a hexagon wrench (JIGHW0009) so that the guide roller turns smoothly. (Do not overloosen the setscrew, which causes insecurity of the guide roller.) (See Figure 4-30.)

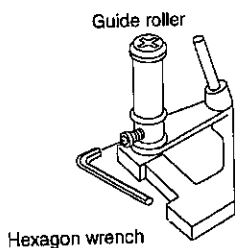


Figure 4-30.

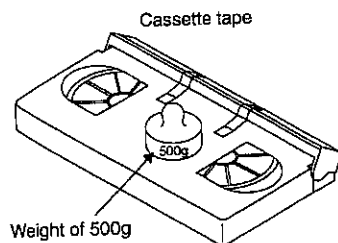


Figure 4-31.

- c) Set the alignment tape (monoscope pattern) on the reel disk, and place the unit in the playback mode. (Place a 500 g weight on the cassette tape to prevent floating of the cassette tape.)
- d) In the X value adjustment mode (see the Electrical Adjustment), change the envelope waveform from MAX to MIN, and MIN to MAX by pushing the (+) or (-) tracking button, and check a flat response is obtained on the waveform.
- e) If a flat response cannot be obtained, roughly adjust the guide rollers on the supply side and take-up side using an adjusting screw driver until a flat response can be obtained.
- f) Tighten the screw ① to eliminate wrinkles from the tape of the retain guide flange area.  
Replace the tape to check the tape on the retain guide flange area for wrinkles.
  - (1) No wrinkle is present.  
Turn the screw ① clockwise to generate wrinkles on the tape at the flange area, and then back off the screw ① as far as the wrinkles are just eliminated.
  - (2) Wrinkles are present.  
Turn the screw ① counterclockwise as far as the wrinkles are just eliminated.

### Reference:

If the screw ① is turned clockwise, wrinkles will be produced on the lower flange.

### Notes:

1. Place the tracking control in the center position, and adjust the X-position so that the PB CHROMA envelope becomes maximum for easier rough adjustment of the tape drive train.
2. In the rough adjustment, pay particular attention to the outlet side.

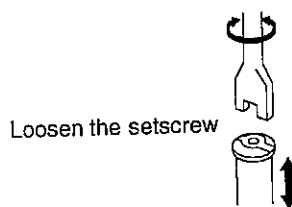


Figure 4-32.

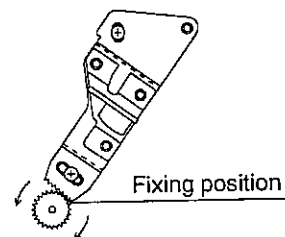


Figure 4-33.

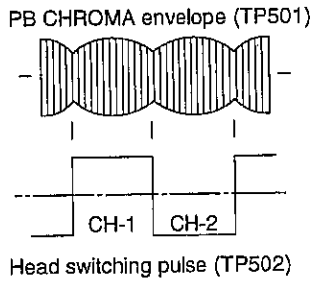


Figure 4-34.

## 7. Adjustment of A/C head height and azimuth

- Connect an oscilloscope to the audio output terminal.
- Using the alignment tape with linear audio pre-recorded signal of 1 kHz, adjust the screws ② and ③ to maximize the audio output, and adjust the screw A to eliminate wrinkles from the tape at the retain guide flange. (Refer to P24-6-f.) Repeatedly adjust the screws ②, ③ and ④ in this sequence until the audio output becomes the maximum. (1 to 3 times as ordinary)
- Using the alignment tape which records a linear audio signal of 6 kHz, finally adjust the screw ② until the audio output becomes the maximum.

## 8. Adjustment of tape drive train and X-Position

- Connect the oscilloscope to the test points (TP501) for PB CHROMA envelope output. Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP502).
- Play back the tape drive train alignment tape.
- Push the (+) or (-) button to change the envelope waveform from MAX to MIN, and MIN to MAX. Adjust the guide roller's height on the supply and take-up sides with an adjusting screw driver, to obtain an envelope waveform that is as flat as possible.
- If the tape is above or below the helical lead, the PB CHROMA waveform will take the shape shown in Figure 4-35.
- Adjust for maximum flatness of the envelope as the step 6, e) in page 24.
- Push the (+) or (-) tracking button to check that a flat response is obtained on the envelope waveform.
- Secure the guide roller by tightening the guide roller set-screw in the unloading mode.
- Play back the tape drive train alignment tape to check that the envelope waveform does not change.

	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Supply side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the envelope.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the envelope.

Figure 4-35.



9. Adjustment of A/C head X-position.

- In the X value adjustment mode (see the Electrical Adjustment), make a short-circuit between TP5005 and TP5006, both located on the operation PWB, to center the tracking.
- Move the A/C head arm with an adjusting gear driver, and adjust the A/C head position for maximum head switching pulse hi side envelope.  
Finally tighten the screws ① and ②. (First tighten the screw ①, and next the screw ②.) (Figure 4-36①②)  
(Reference: Final tightening torque: 0.6 N.m as preferable.)
- Adjust the playback switching point.
- Check the flatness of the envelope waveform and sound by playing back a recorded tape.

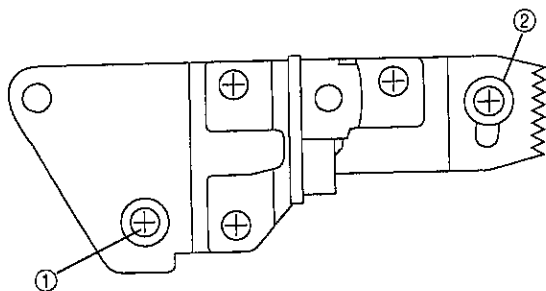


Figure 4-36.

## REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

- Remove the cassette housing control assembly.
- Removal (Follow the order of indicated numbers.)

- Disconnect from the board-to-board connector on the main PWB.
- Remove the drive belt ①.
- Remove the screws ②.

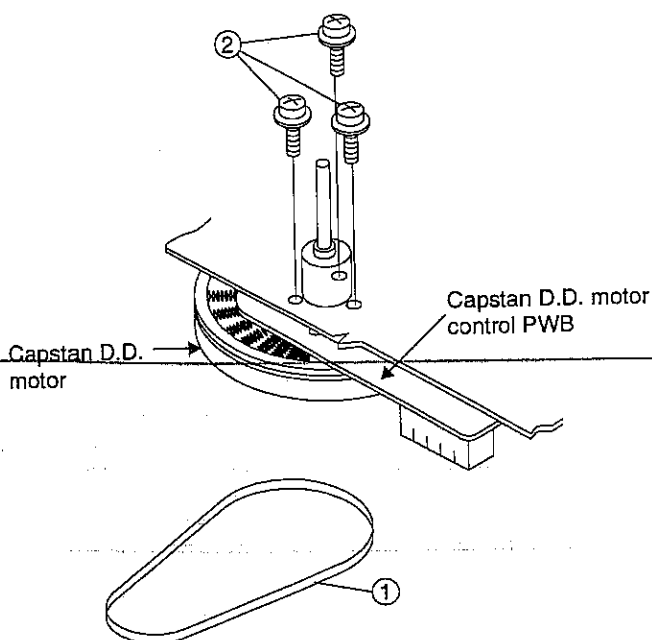


Figure 4-37.

## Reassembly

- Mount the capstan motor on the mechanism chassis making sure not to allow the capstan shaft to hit the mechanism chassis, and attach it with the three screws.
- Attach the reel belt. Reconnect to the board-to-board connector on the main PWB.

## Notes:

- After installing the capstan D.D. motor, be sure to rotate the capstan D.D. motor and check the movement.
- Check the servo circuit.

## REPLACEMENT OF DRUM D.D. MOTOR

- Put the unit in the cassette eject position.
- Unplug the power cord.

## Removal (Reverse the order in reassembly.)

- Disconnect the FFC cable ①.
- Unscrew the D.D. stator assembly fixing screws ②.
- Take out the D.D. stator assembly ③.
- Unscrew the D.D. rotor assembly fixing screws ④.
- Take out the D.D. rotor assembly ⑤.

## Notes:

- In removing the D.D. stator assembly, part of the drum earth spring pops out of the pre-load collar.  
Be careful not to lose it.
- Secure the D.D. rotor assembly so that the installation positioning holes in the D.D. rotor assembly and upper drum assembly match.  
(Match the upper drum's notch with the rotor's hole.)
- Be careful not to damage the upper drum or the video head.
- Be sure that the hall device and the D.D. stator assembly are not damaged by the D.D. rotor assembly or other parts.
- After installation, adjust the playback switching point.

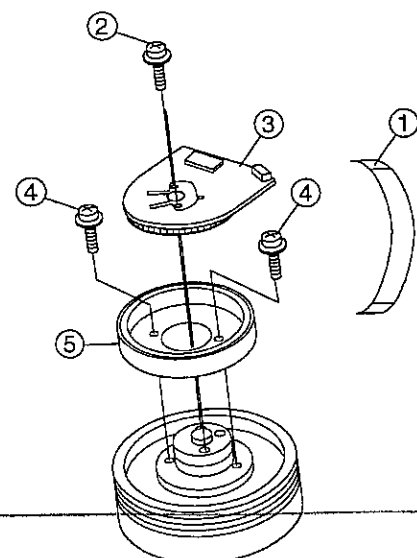


Figure 4-38.

## ASSEMBLE THE MECHANISM'S PARTS REQUIRING THE PHASE MATCHING IN THE STEPS BELOW.

1. Assembling the pinch roller assembly, reverse guide assembly and the pinch drive cam (on the front of the mechanism chassis).
2. Mounting the shifter (on the back of the mechanism chassis).
3. Mounting the master cam (on the back of the mechanism chassis).
4. Mounting the connection gear, slow brake and loading motor assemblies (on the back of the mechanism chassis).

### 1. Assembling the pinch roller assembly, reverse guide assembly and the pinch drive cam (on the front of the mechanism chassis).

Place the following parts in position in numerical order.

- (1) Reverse drive lever ①
- (2) Reverse guide spring ②
- (3) Reverse guide lever ass'y ③
- (4) R/G adjusting nut ④
- (5) Pinch drive cam ⑤
- (6) Pinch roller ass'y ⑥
- (7) Open lever ⑦

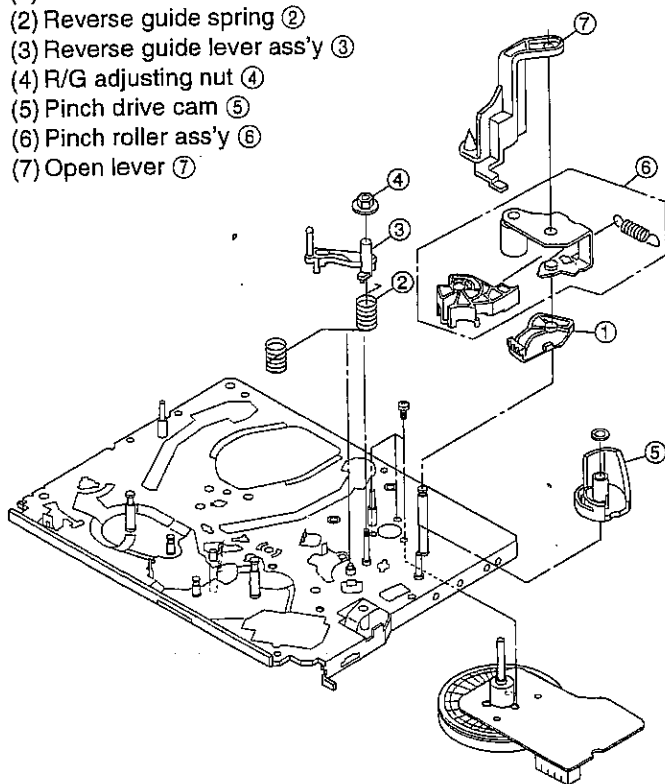
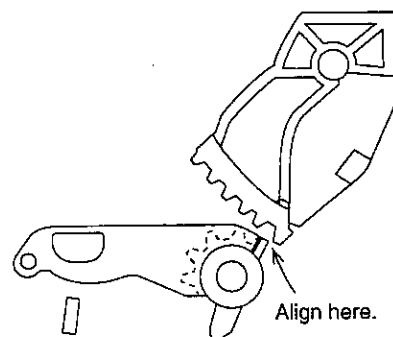


Figure 4-39.

#### ① Insert Reverse Guide Lever Ass'y



#### ② Insert Pinch Drive Cam

Turn the reverse guide lever assembly counterclockwise to the stopper.

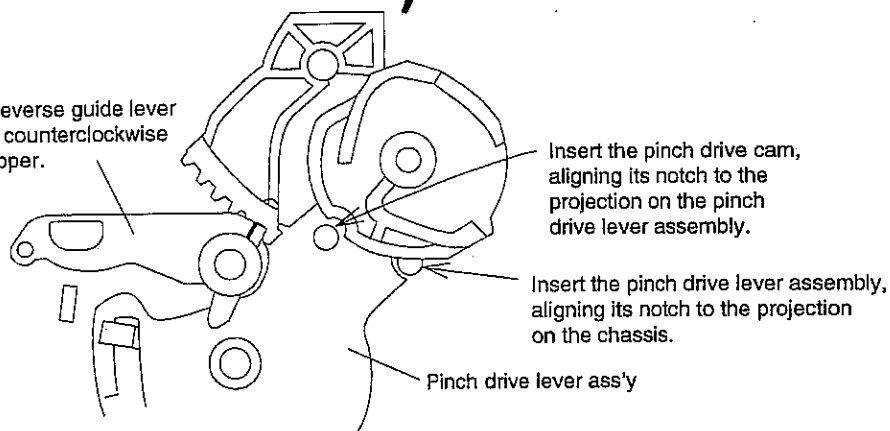
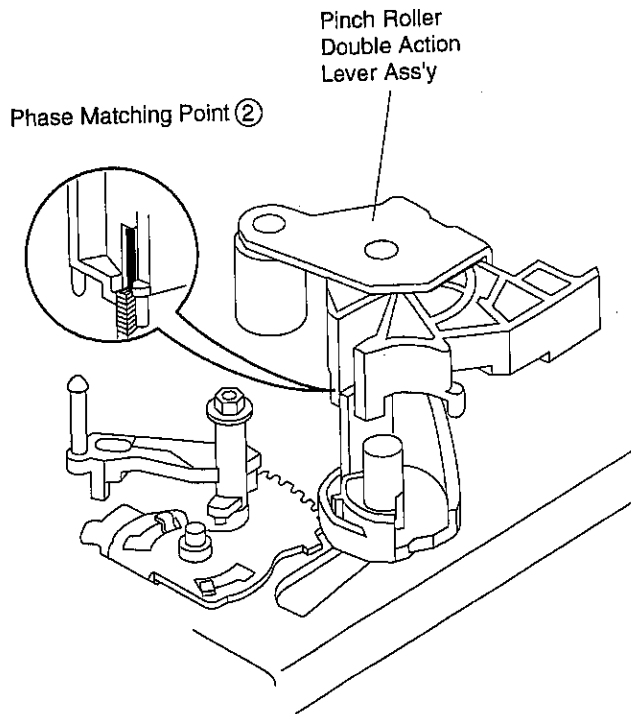


Figure 4-40-1.

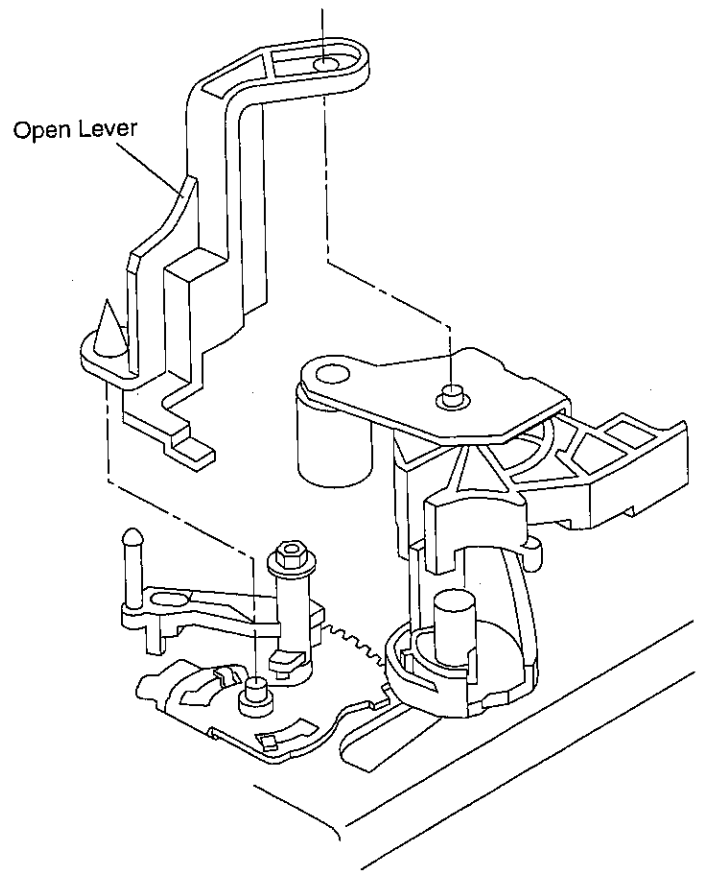
**VC-ML3**  
**VC-ML3W**

③ Insert Pinch Roller/Pinch Double Action Lever Ass'y.



**Figure 4-40-2.**

④ Insert Open Lever.



**Figure 4-40-3.**

## 2. Mounting the shifter (on the back of the mechanism chassis).

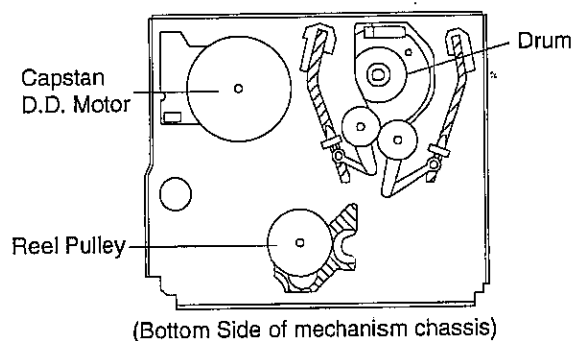


Figure 4-41.

1. Make sure that the loading gear is at the point ① as shown below.
2. Place the shifter in position, keeping in mind the 6 insertion points and the three relief points.
3. For the phase matching at the insertion point ①, see the point ② as shown below.
4. Finally fix the shifter with two washers located on insert points ① and ④.

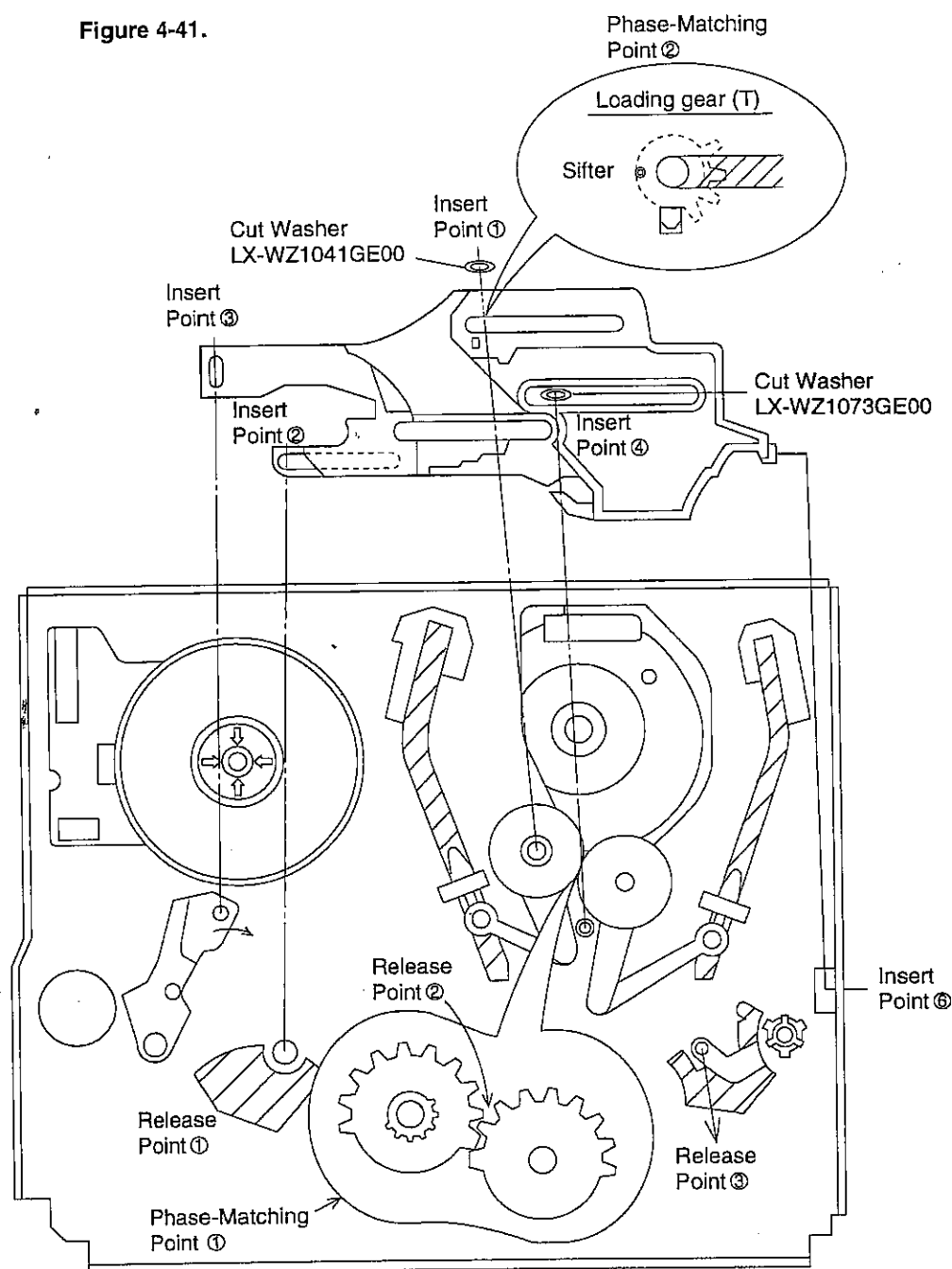


Figure 4-42.

### 3. Mounting the master cam (on the back of the mechanism chassis).

- (1) Make sure beforehand that the shifter is at the point as shown below.
- (2) Place the master cam in the position as shown below.

**Note:**

See the figure below for the phase matching between the master cam and the cassette control drive gear.  
(3) Finally fix the master cam with E ring.

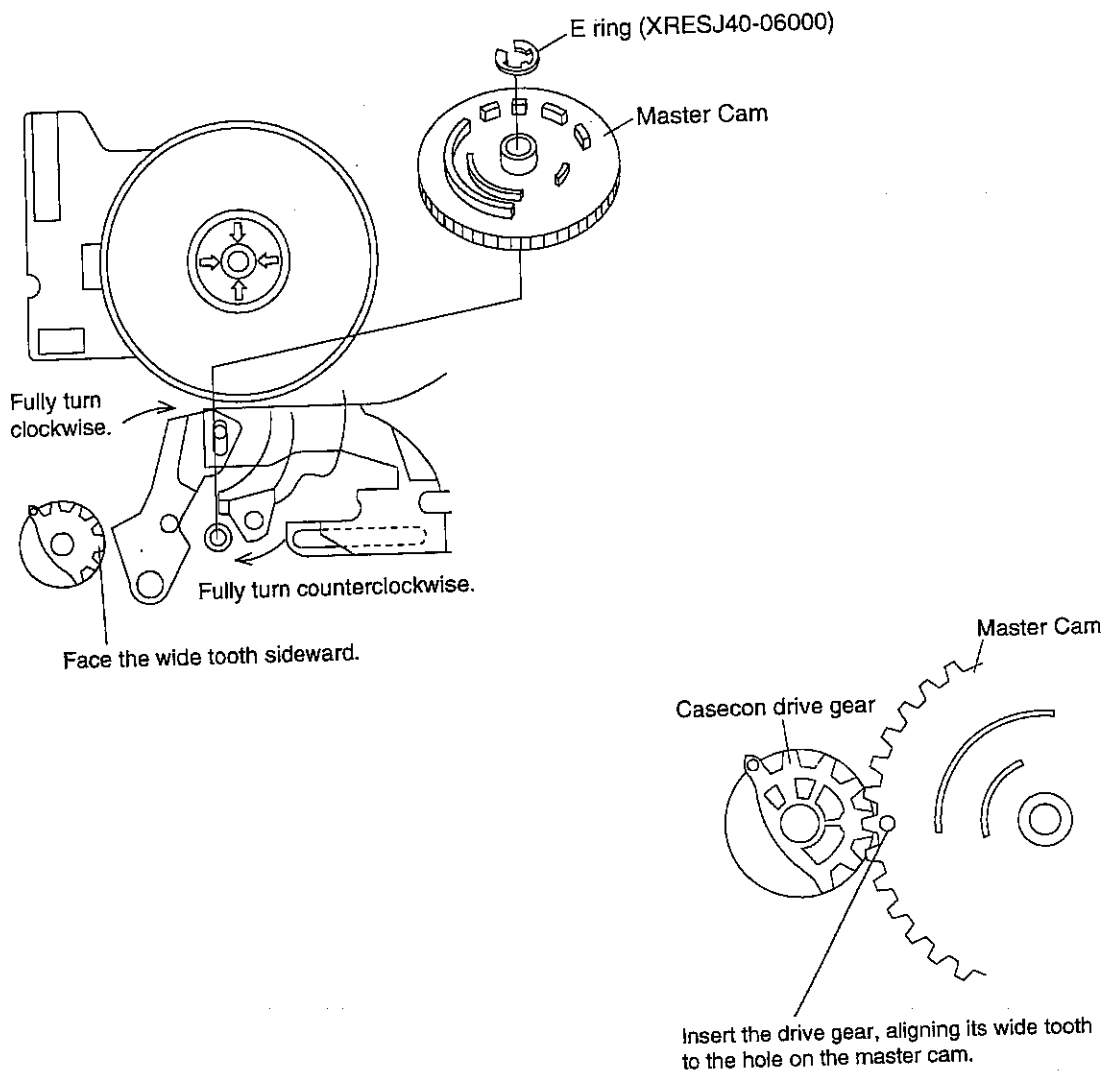


Figure 4-43.

## REPLACEMENT OF LOADING MOTOR

### • Removal

Remove 2 screws.

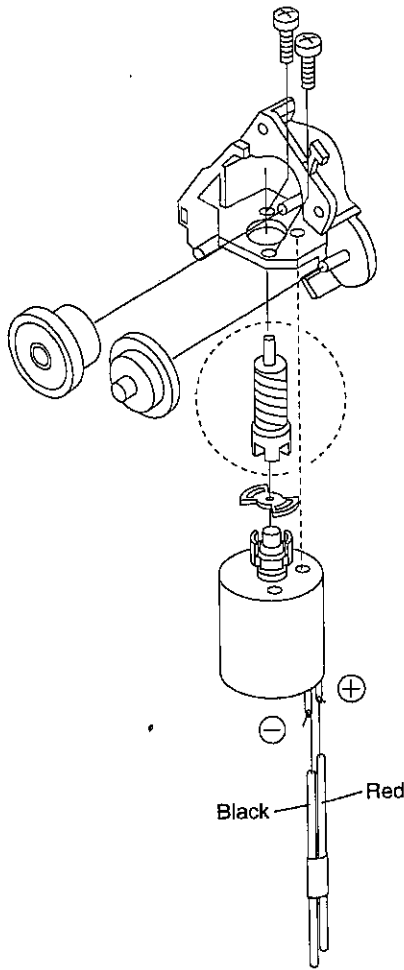


Figure 4-44.

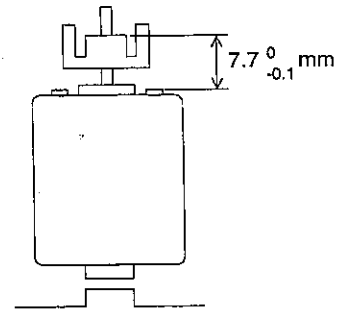


Figure 4-45.

Press-fit the loading motor pulley with a force of less than 98N (10 kgf). Be sure that the pulley is  $7.7 \begin{smallmatrix} 0 \\ -0.1 \end{smallmatrix}$  mm away from the motor.

### • Replacement

- ① Take out the old loading motor. Place a replacement loading motor as shown above (Figure 4-44.).

VC-ML3  
VC-ML3W

## ASSEMBLY OF CASSETTE HOUSING

① Framer ass'y

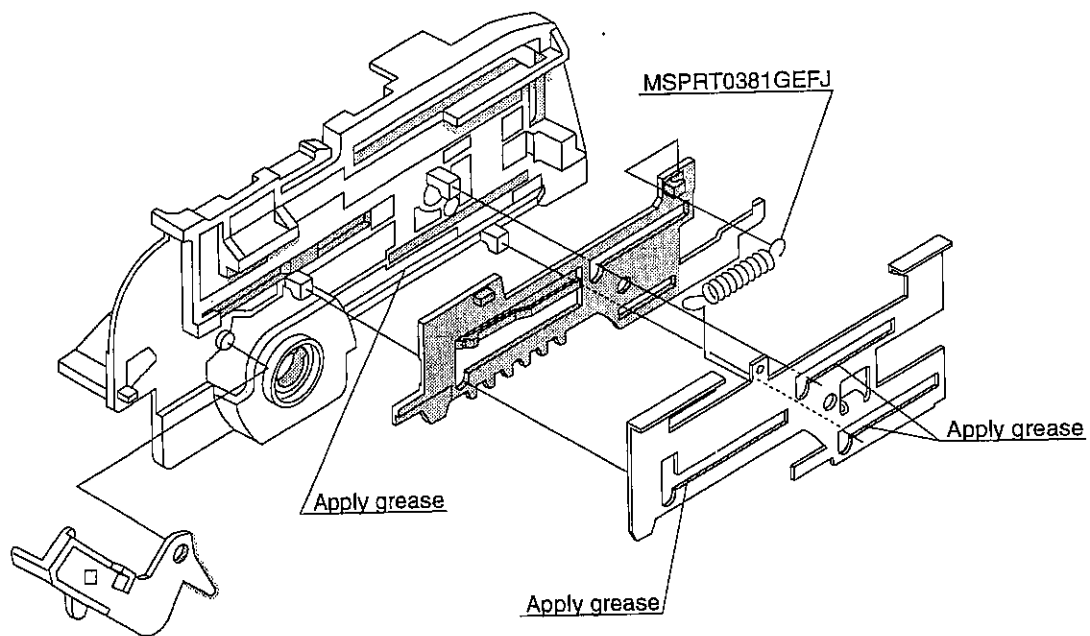


Figure 4-46.

② Synchro Gear, Drive Gear L and Drive Gear R

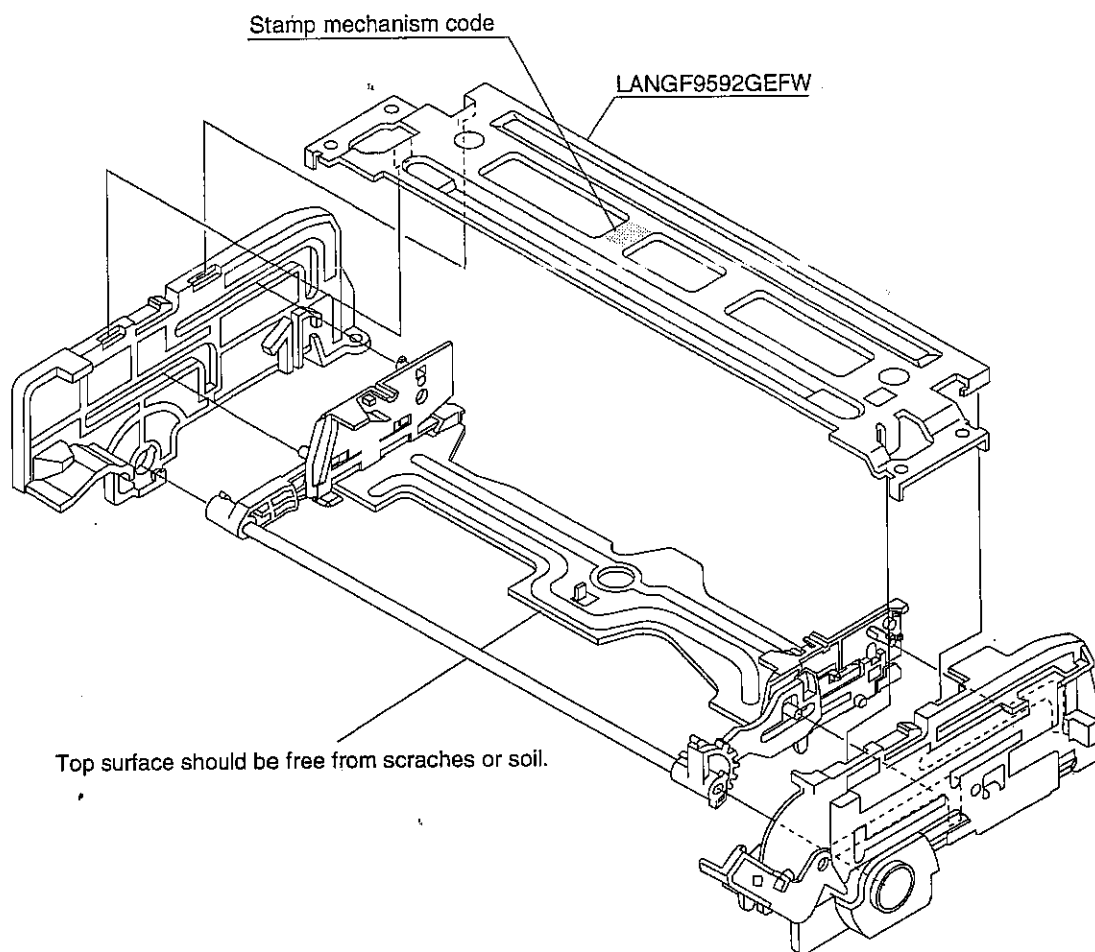


Figure 4-47.

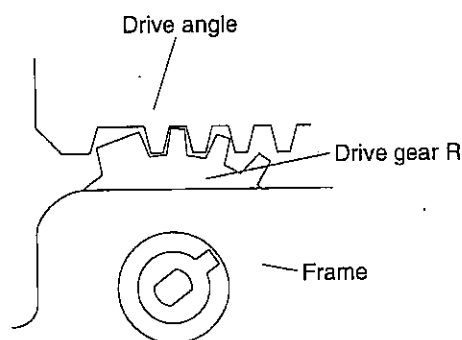


Figure 4-48.



## 5. ELECTRICAL ADJUSTMENT

### Notes:

- Before the adjustment:  
Electrical adjustments discussed here are often required after replacement of electronic components and mechanical parts such as video heads.  
Check that the mechanism and all electric components are in good working condition prior to the adjustments, otherwise adjustments can not be completed.

- Instruments required:

- Colour TV monitor
- Audio signal generator
- DC voltmeter
- Blank video cassette tape
- Screwdriver for adjustment
- Colour bar signal generator
- Dual-trace oscilloscope
- AC milli-voltmeter
- Frequency counter
- Alignment tape (VROCPSV)
- Alignment tape (VROATSV)
- Alignment tape (VROCBFFS)
- Alignment tape (VROCPZJS)

### ※ Servicing precautions

When the IC703 (E<sup>2</sup>PROM) has been replaced, make the following reprogramming. Depending on models, the IC703 (E<sup>2</sup>PROM) has been factory-adjusted for its memory function.

It's therefore necessary to reprogram the memory function for the model in question.

Note that the servo circuit requires readjustments for the head switching point, slow and still modes.

### • Location of controls and test points

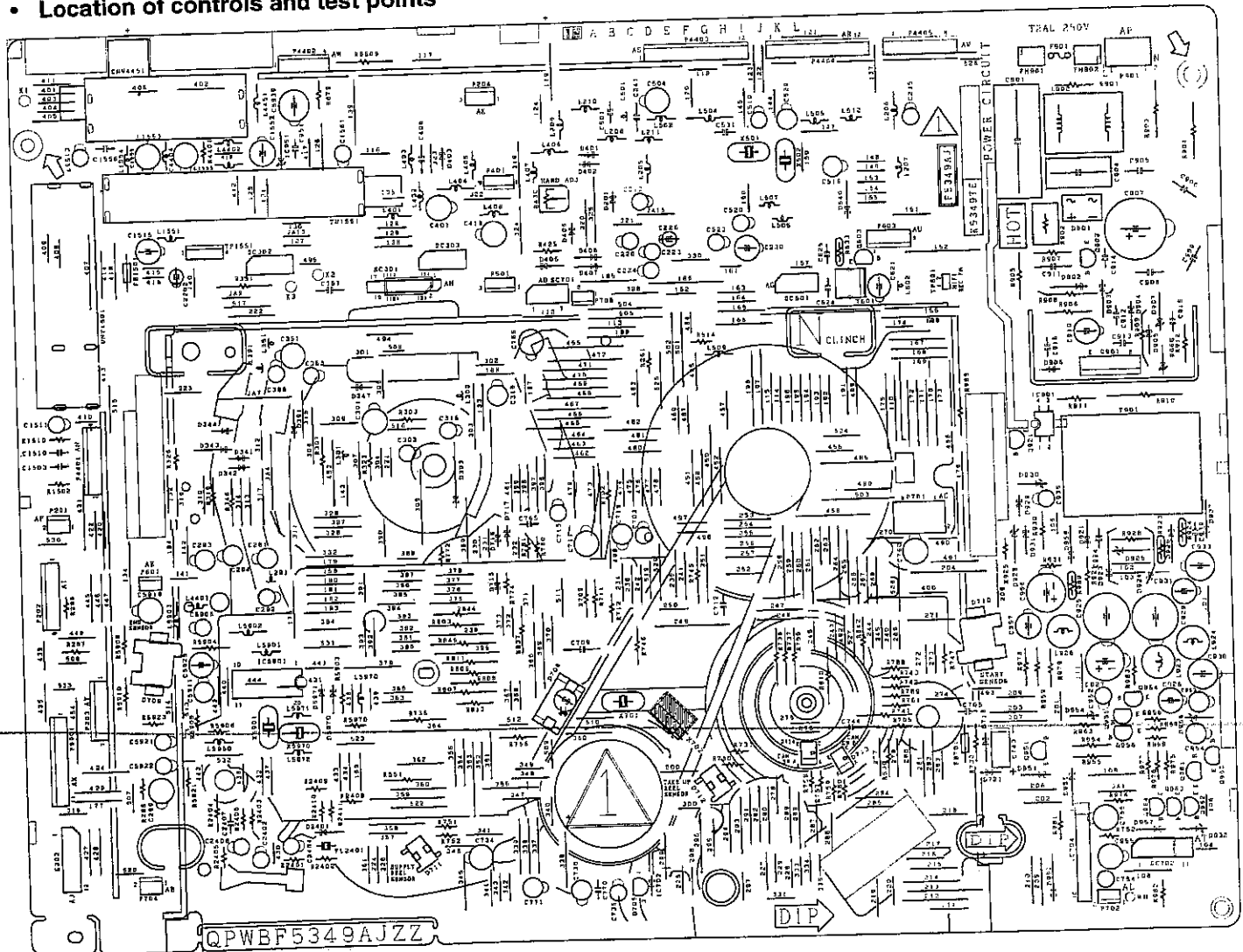


Figure 5-1.

## SERVO CIRCUIT ADJUSTMENT

### ADJUSTMENT OF PAL SYSTEM HEAD SWITCHING POINT

Measuring instrument	Dual-trace oscilloscope Colour TV monitor
Mode	Playback
Cassette	Alignment tape (VROCPSV)
Test point	TP502 (H.S.W.P.) to CH-1, VIDEO OUT jack to CH-2 (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side.)
Specification	$6.5 \pm 0.5H$ (lines)

1. Remove the front panel and play the alignment tape. (VROCPSV)  
(Playback picture on the monitor screen.)
2. Make for a moment short-circuit between TP5001 and TP5002, both located on the operation PWB.  
Make the test points short-circuited and see if the REC LED and the TIMER LED light up.  
(See Note below ①)
3. Press the PLAY button, in the automatic adjustment mode.
4. Make sure the REC LED is flashing during the automatic adjustment.
5. When the automatic adjustment is over, the REC LED goes out.
6. Press the STOP button to return to normal mode.
7. Make sure the head switching point has been properly adjusted. Play back the alignment tape and check to see if the waveform on the oscilloscope screen is as shown in figure 5-2.  
If out of spec, call the test mode again. Press the FF or REW button to get the specified value.

#### Note:

- ① Set-up of TEST mode.  
When the adjustment of HEAD SWITCHING POINT, AUTO TRACKING function is invalid.
- ② When the cassette housing control ass'y is removed, set-up of mechanism operating mode.
  - 1) Replug the AC power cord it a few minutes later.
  - 2) Make a short-circuit between TP5005 and TP5006, both located on the operation PWB, to center the tracking.
  - 3) AC power cord is plugged in.
  - 4) You can make mechanism operating mode.

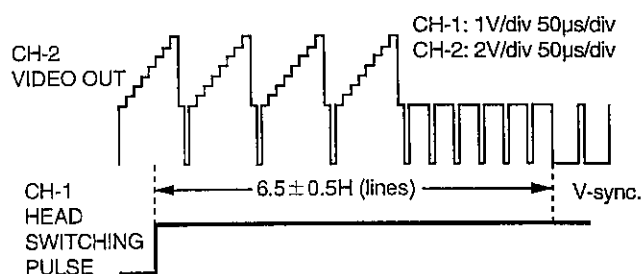


Figure 5-2.

### ADJUSTMENT OF PAL SYSTEM SP/LP SLOW TRACKING PRESET

Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Self-recorded tape (SP/LP mode) (See Note below)
Control	Tracking control buttons (+) or (-)
Specification	Minimized noise on monitor screen

1. Have the unit to receive a good TV broadcast or feed a video signal to the VIDEO IN jack.
2. Set the tape speed in SP mode by using the remote control and record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
5. Make for a moment short-circuit between TP5001 and TP5002, both located on the operation PWB.  
Make the test points short-circuited and see if the REC LED and the TIMER LED light up.
6. Look at the monitor screen and adjust the (+) or (-) TRACKING buttons so that the there is noise disappears from the screen.
7. Press the STOP button to return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is no noise in the screen.  
(For the LP mode put adjustment at the same adjustment way as SP mode.)

#### Notes:

Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.

## ADJUSTMENT OF PAL SYSTEM FV (False Vertical Sync) OF STILL PICTURE

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Self-recorded tape (SP mode) (See Note below)
Control	Tracking control buttons (+) or (-)
Specification	No vertical jitter of picture

1. Play a cassette which was recorded by the unit in SP mode.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust (+) or (-) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape in SP mode and make sure vertical jitter of the picture is not noticeable.  
(For the LP mode put adjustment at the same adjustment way as SP mode.)

### Note:

Self-recorded tape is a cassette whose program was recorded by the unit being adjusted.

## ADJUSTMENT OF NTSC SYSTEM HEAD SWITCHING POINT

Measuring instrument	Dual-trace oscilloscope Colour TV monitor
Mode	Playback
Cassette	Alignment tape (VROATSV)
Test point	TP502 (H.S.W.P.) to CH-1, VIDEO OUT jack to CH-2 (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side.)
Specification	$6.5 \pm 0.5H$ (lines)

1. Remove the front panel and play the alignment tape. (VROATSV)  
(Playback picture on the monitor screen.)
2. Make for a moment short-circuit between TP5001 and TP5002, both located on the operation PWB.  
Make the test points short-circuited and see if the REC LED and the TIMER LED light up.  
(See Note below ①)
3. Press the PLAY button, in the automatic adjustment mode.
4. Make sure the REC LED is flashing during the automatic adjustment.
5. When the automatic adjustment is over, the REC LED goes out.
6. Press the STOP button to return to normal mode.
7. Make sure the head switching point has been properly adjusted. Play back the alignment tape and check to see if the waveform on the oscilloscope screen is as shown in figure 5-3.  
If out of spec, call the test mode again. Press the FF or REW button to get the specified value.

### Note:

- ① Set-up of TEST mode.  
When the adjustment of HEAD SWITCHING POINT, AUTO TRACKING function is invalid.
- ② When the cassette housing control ass'y is removed, set-up of mechanism operating mode.
  - 1) Replug the AC power cord it a few minutes later.
  - 2) Make a short-circuit between TP5005 and TP5006, both located on the operation PWB, to center the tracking.
  - 3) AC power cord is plugged in.
  - 4) You can make mechanism operating mode.
- ③ With the PAL system head switching point already adjusted, it is not necessary to adjust the NTSC system head switching point. Just observe the waveform at the above test point and makes sure that it is as specified.

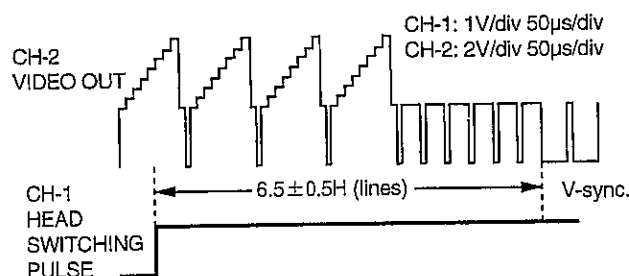


Figure 5-3.

### ADJUSTMENT OF NTSC SYSTEM SP/EP SLOW TRACKING PRESET

Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Self-recorded tape (SP/EP mode) (See Note below)
Control	Tracking control buttons (+) or (-)
Specification	Minimized noise on monitor screen

1. Have the unit to receive a good TV broadcast or feed a video signal to the VIDEO IN jack.
2. Set the tape speed in SP mode by using the remote control and record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
5. Make for a moment short-circuit between TP5001 and TP5002, both located on the operation PWB. Make the test points short-circuited and see if the REC LED and the TIMER LED light up.
6. Watching the monitor screen, adjust the tracking (+) and (-) buttons so that the noise on the screen be minimum.
7. Press the STOP button to return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is no noise in the screen.  
(For the EP mode put adjustment at the same adjustment way as SP mode.)

#### Notes:

Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.

### ADJUSTMENT OF NTSC SYSTEM FV (False Vertical Sync) OF STILL PICTURE

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Self-recorded tape (SP mode) (See Note below)
Control	Tracking control buttons (+) or (-)
Specification	No vertical jitter of picture

1. Play a cassette which was recorded by the unit in SP mode.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust (+) or (-) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape in SP mode and make sure vertical jitter of the picture is not noticeable.  
(For the LP mode put adjustment at the same adjustment way as SP mode.)

#### Note:

Self-recorded tape is a cassette whose program was recorded by the unit being adjusted.

### ADJUSTMENT OF NTSC SKEW COMPENSATION

Measuring instrument	Colour TV monitor
Mode	Playback still (SP mode)
Cassette	Alignment tape (VROATSV)
Control	R5410 (Flicker control)
Specification	No flicker on the monitor TV screen

1. Play the alignment tape (VROATSV) and place the unit to the playback still mode.
2. Look at the monitor screen and adjust R5410 so that the flicker of the picture to be minimized.

## Y/C CIRCUIT ADJUSTMENT

### CHECKING OF VIDEO E-E LEVEL

Measuring instrument	Oscilloscope
Mode	E-E or Record
Input signal	EIA colour bar (1.0Vp-p PAL and NTSC system)
Test point	VIDEO OUT jack
Specification	1.0 ± 0.2Vp-p

1. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.  
(See Note below.)
2. Feed a colour bar signal to the VIDEO IN jack.
3. Make sure that the E-E signal amplitude is 1.0Vp-p as shown in Figure 5-4.
4. For the NTSC mode, put to checking in the same way as PAL mode.

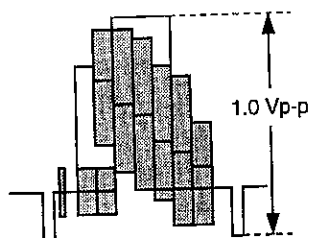


Figure 5-4.

#### Notes:

If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

### CHECKING OF WHITE CLIP LEVEL

Measuring instrument	Oscilloscope
Mode	E-E or Record (PAL LP/NTSC EP mode)
Input signal	EIA colour bar (1.0Vp-p PAL and NTSC system)
Test point	Pin(48) of IC401, GND
Specification	190 ± 5% (See note below)

1. Connect a oscilloscope to pin(48) of IC401 and GND.
2. Feed the colour bar signal to the VIDEO IN jack and set the unit in E-E or recording mode.
3. Make sure that the overshoot of the video signal is clipped at 190% as shown in Figure 5-5.
4. For the NTSC mode, put to checking in the same way as PAL mode.

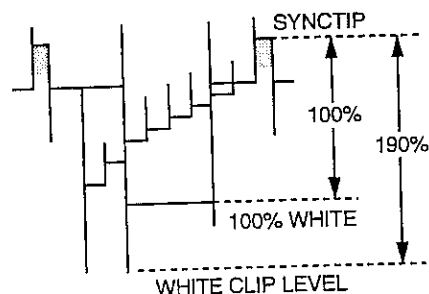


Figure 5-5.

#### Note:

From sync tip to white peak, the level is 100%.  
The white clip level is 90% above the white level.

### CHECKING OF RECORD LEVEL

Measuring instrument	Dual-trace oscilloscope
Mode	Record mode (PAL LP/NTSC EP mode)
Input signal	EIA colour bar (1.0Vp-p PAL and NTSC system)
Test point	Chroma (Red) R514 terminal lead at L509 side (Sig.) ~ GND Sync tip R225 terminal lead at L210 side (Sig.) ~ GND
Specification	Chroma (Red): 170~230mVp-p Sync tip: 720~880mVp-p

1. Feed the colour bar signal to the VIDEO IN jack and set the unit in recording mode.
2. Connect a dual -trace oscilloscope to each test point shown in table.
3. Make sure so that the amplitude of the chrome (Red) portion and the sync tip portion are specified as shown in Figure 5-6.
4. For the NTSC mode, put to checking in the same way as PAL mode.

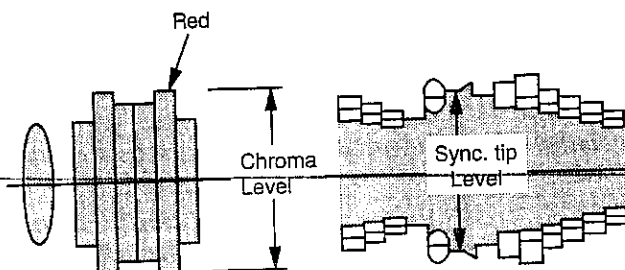


Figure 5-6 (a).

Figure 5-6 (b).

## CHECKING OF PLAYBACK LEVEL

Measuring instrument	Oscilloscope
Mode	Record/Playback (PAL LP/NTSC EP mode)
Input signal	EIA colour bar (1.0Vp-p PAL and NTSC system)
Test point	VIDEO OUT jack
Specification	$1.0 \pm 0.2\text{Vp-p}$

1. Be sure that E-E level has been correctly specified.
2. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.  
(See Note below.)
3. Feed a colour bar signal to the VIDEO IN jack and set the unit in recording mode.
4. Play the colour bar portion of the recorded tape.
5. Make sure that the output signal amplitude is 1.0Vp-p as shown in Figure 5-7.
6. For the NTSC mode, put to checking in the same way as PAL mode.

**Note:**

If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

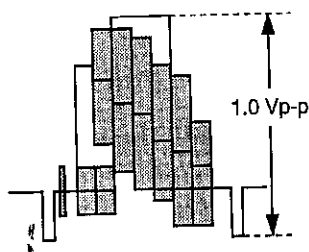


Figure 5-7.

## ADJUSTMENT OF S. PICTURE

Measuring instrument	Colour TV monitor
Mode	Record/Playback (PAL SP mode)
Input signal	Monoscope signal
Test point	TP402 (Sig) ~ TP403 (GND)
Control	R430 (S. Picture control)
Specification	—

1. Record the PAL monoscope signal in the SP mode. Play back the signal.
2. Connect a 1M ohm resistor between the test points TP402 (SIG) and TP403 (GND).
3. With the picture perfect on the monitor screen, slowly turn R430 (S.PICTURE control) until there will be problem with the picture.
4. Then disconnect the above resistor, Finally make sure the picture on the screen turns perfect again.

**CHECKING OF PLAYBACK LEVEL**

Measuring instrument	Oscilloscope
Mode	Record/Playback (PAL LP/NTSC EP mode)
Input signal	EIA colour bar (1.0Vp-p PAL and NTSC system)
Test point	VIDEO OUT jack
Specification	$1.0 \pm 0.2\text{Vp-p}$

1. Be sure that E-E level has been correctly specified.
2. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.  
(See Note below.)
3. Feed a colour bar signal to the VIDEO IN jack and set the unit in recording mode.
4. Play the colour bar portion of the recorded tape.
5. Make sure that the output signal amplitude is 1.0Vp-p as shown in Figure 5-7.
6. For the NTSC mode, put to checking in the same way as PAL mode.

**Note:**

If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

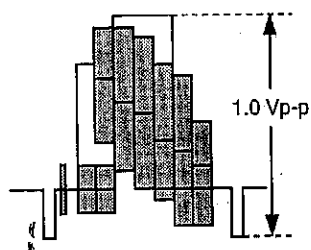


Figure 5-7.

**ADJUSTMENT OF S. PICTURE**

Measuring instrument	Colour TV monitor
Mode	Record/Playback (PAL SP mode)
Input signal	Monoscope signal
Test point	TP402 (Sig) ~ TP403 (GND)
Control	R430 (S. Picture control)
Specification	_____

1. Record the PAL monoscope signal in the SP mode. Play back the signal.
2. Connect a 1M ohm resistor between the test points TP402 (SIG) and TP403 (GND).
3. With the picture perfect on the monitor screen, slowly turn R430 (S.PICTURE control) until there will be problem with the picture.
4. Then disconnect the above resistor, Finally make sure the picture on the screen turns perfect again.

## Hi-Fi AUDIO CIRCUIT ADJUSTMENT. IMPORTANT NOTES ON Hi-Fi SECTION.

1. Though adjustment procedures are written for the left channel, those for the right channel are basically the same.  
Words shown in the bracket "[ ]" are for the right channel only.

2. SERVICING OF THE Hi-Fi block.

### 1) "RECORD MODE".

Under this condition record a stereo broadcast on tape and adjust control.

### 2) "PLAYBACK MODE".

Under this condition play a Hi-Fi tape and adjust control.

(You can select the audio output channels in the playback mode by pressing the MENU button on the remote control or the SET UP button on the VCR. Set the desired Audio Output mode by pressing the (+) or (-) button.

The Audio Output mode will change in the normally select Hi-Fi L+R mode with the pressing the (+) or (-) button both the L and R audio channels are taken from the Hi-Fi mode track. The L and R indicators light up on the Multi-function display in this mode.)

### • Location of controls and test points

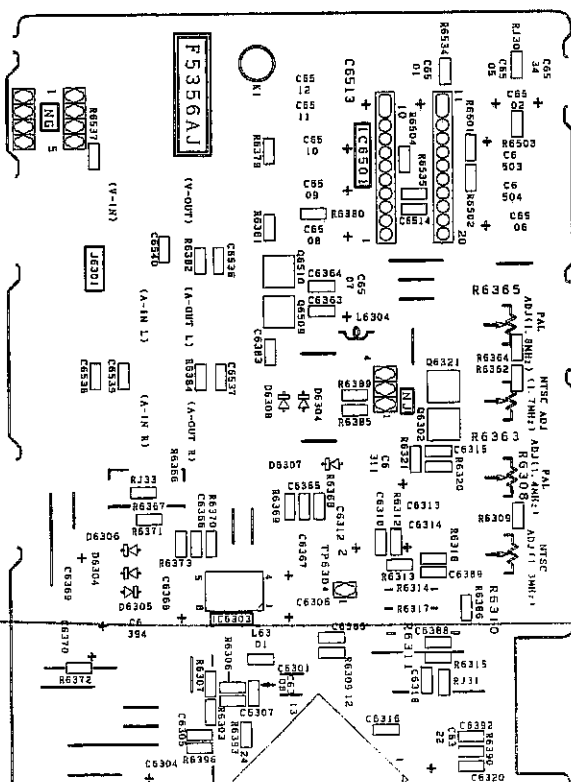


Figure 5-8.

## CHECKING OF E-E LEVEL

Measuring instrument	AC milli-voltmeter
Mode	E-E or REC mode
Input signal	1kHz, -8dBs
Test point	AUDIO OUT jack
Specification	-8 ± 2dBs

1. Feed the audio signal shown in table to the left channel of the AUDIO IN jack.
2. Connect an AC milli-voltmeter to the left channel of the AUDIO OUT jack and right channel of the AUDIO OUT jack.
3. Put the unit in E-E or record mode and make sure that the milli-voltmeter read is specified value.

### NOTE:

Check the level is less than 2dBs both Left and Right channels.

## ADJUSTMENT OF FM CARRIER FREQUENCY

Measuring instrument	Frequency counter
Mode	E-E or REC mode
Input signal	Not required
Test point	TP6301 (Sig.) ~ TP6302 (GND)
Controls	R6310 [R6363] NTSC Carrier frequency control R6308 [R6365] PAL Carrier frequency control
Specification	1.3 [1.7] MHz ± 5kHz (at NTSC mode) 1.4 [1.8] MHz ± 5kHz (at PAL mode)

1. Put the unit in A/V input mode. Do not feed any signal to the VIDEO IN JACK.  
(Disconnect any cable from video input terminal.)
2. Put the unit in E-E or recording mode and connect a frequency counter to test points TP6301 (Sig.) and TP6302 (GND).
3. Put the unit in NTSC mode and adjust R6310 [R6363] (NTSC carrier control) so that the counter read is specified value.
4. In the next, place the unit in PAL mode and adjust R6308 [R6365] (PAL carrier control) so that the counter read is specified value.



**CHECKING OF LINEAR AUDIO PLAYBACK LEVEL**

Measuring instrument	AC milli-voltmeter
Mode	Playback
Input signal	Alignment tape.(VROCPZJS)
Test point	AUDIO OUT jack
Specification	$-12.0 \pm 2\text{dB}$

1. Connect an AC milli-voltmeter to the AUDIO OUT jack.
2. Playback the Alignment tape. (VROCPZJS)
3. Make sure that the output level is as specified.

**CHECKING OF HI-FI AUDIO PLAYBACK LEVEL**

Measuring instrument	AC milli-voltmeter
Mode	Playback
Cassette	Alignment tape (VROCBFFS)
Test point	AUDIO OUT jack
Specification	$-8.0 \pm 2\text{dBs}$ (at RCA jack)

1. Connect an AC milli-voltmeter to the AUDIO OUT jack.
2. Play the alignment tape (VROCBFFS).
3. Make sure that the AUDIO OUT level is as specified.

**Note:**

Check the PLAYBACK level is less than 2.0dBs both Left and Right channels.

**CHECKING OF HI-FI/LINEAR AUDIO SELF-RECORD/PLAYBACK LEVEL**

Measuring instrument	AC milli-voltmeter
Mode	Record/playback
Input signal	1kHz, $-8.0\text{dBs}$
Test point	AUDIO OUT jack
Specification	$-8.0 \pm 3\text{dBs}$

1. Feed the audio signal shown in table to the Left channel AUDIO IN jack.
2. Connect an AC milli-voltmeter to the Left channel AUDIO OUT jack and Right channel AUDIO OUT jack.
3. Make sure so that the milli-voltmeter reads spcified value.

**Note:**

Check the PLAYBACK level is less than 2.0dB both Left and Right channels.

**CHECKING OF ERASE VOLTAGE AND OSCILLATION FREQUENCY**

Measuring instrument	Oscilloscope
Mode	Record
Cassette	Full erase head
Test point	T6301
Specification	$70 \pm 5\text{kHz}$ , 40Vp-p or greater

1. Put the unit in record mode.
2. Connect an oscilloscope across the full erase head.
3. Make sure the erase voltage across the full erase head is approx. 40Vp-p or more and frequency is  $70 \pm 5\text{kHz}$ .

## LCD DISPLAY CIRCUIT ADJUSTMENT

### CONTRAST ADJUSTMENT

Measuring instrument	Oscilloscope
Mode	E-E
Input signal	PAL video signal (white 50%)
Test point	TP8941 (G output) ~ GND(TP8943)
Control	R8902 (CONTRAST ADJ.)
Specification	Luminance level to be the same (+0.1Vp-p)

1. In the A/V mode, feed the PAL video signal (white 50%) to the video input terminal.
2. Connect the oscilloscope between TP8941 (G output) and GND. Adjust R8902 (contrast control) so that the normal white portion and the inverted one of the G output waveform be at the same level.

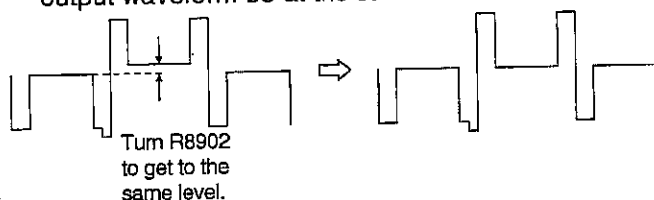


Figure 5-9.

### H-POSITION ADJUSTMENT

Measuring instrument	Colour Monitor TV
Mode	Playback
Cassette	Alignment tape (VROCPSV)
Control	R9021 (H-POSITION ADJ.)
Specification	Monoscope pattern to be centered on screen

1. Play back the alignment tape (VROCPSV).
2. Observing the monitor screen, turn R9021 (H-position control) until the monoscope pattern gets centered on the screen.

### COMMON BIAS ADJUSTMENT (ROUGH ADJUSTMENT)

Measuring instrument	DC voltmeter
Mode	E-E
Input signal	PAL video signal (white 50%)
Test point	TP9045 (COM-BIAS ADJ.)
Control	R9061 (COM-BIAS ADJ.)
Specification	$1.5 \pm 0.1V_{p-p}$

1. In the A/V mode, feed the PAL color bar signal to the video input terminal. Connect the DC voltmeter between TP9045 (common bias) and GND.
2. Turn R9061 (common bias control) until the DC voltmeter reading becomes 1.5V.

### WHITE BALANCE ADJUSTMENT

Measuring instrument	Oscilloscope
Mode	E-E
Input signal	PAL video signal (white 50%)
Test point	TP8941 (G output) - GND, TP8940 (R output) - GND, TP8942 (B output) - GND
Control	R8966 (SUB BRIGHT-R ADJ.), R8961 (SUB BRIGHT-B ADJ.)
Specification	Luminance level to be the same (+0.1Vp-p)

1. Before making this adjustment, make sure that the contrast has been completely adjusted.
2. Call the A/V input mode and feed the PAL video signal (50% white) to the video input terminal.
3. Connect the oscilloscope between TP8940 and GND, and adjust R8966 to have the specified luminance value. Reconnect the oscilloscope between TP8942 and GND, and adjust R8961 to have the same luminance level.

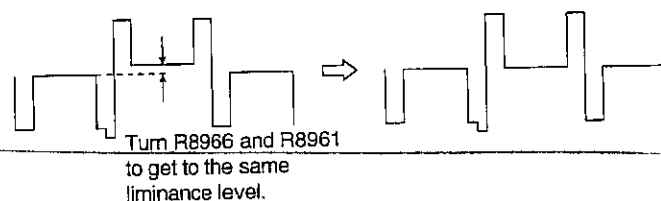


Figure 5-10.

**BURSTCLEANING ADJUSTMENT (IN PAL MODE ONLY)**

Measuring instrument	Oscilloscope
Mode	E-E (BLUE BACK mode)
Input signal	No signal
Control	C8911 (PAL COLOUR BURST ADJ.)
Specification	Make such adjustment that there will be no horizontal streaks.)

1. In the PAL mode, make the blue background on the LCD panel.
2. Watching the LCD panel, adjust C8911 so that there will be no horizontal streaks. (Be sure to call the PAL mode. In the NTSC mode, the blue background mode does not change with C8911.)

**COMMON BIAS ADJUSTMENT (FINE ADJUSTMENT)**

Measuring instrument	Colour Monitor TV
Mode	E-E
Input signal	NTSC 10-step-wave video signal
Control	R9021 (H-POSITION ADJ.)
Specification	Vertical stripes to disappear from screen

1. In the A/V mode, feed the NTSC 10-step-wave video signal to the video input terminal.
2. Observing the monitor screen, slowly turn R9061 (common bias control) until the vertical stripes disappear from the screen.

**Note:**

Be sure to turn the control slowly. The changing image cannot be observed if the control is turned quickly.

## RF CIRCUIT

### ADJUSTMENT OF RF AGC CIRCUIT

Measuring instrument	Oscilloscope
Mode	Good TV Commercial broadcast reception
Test point	TP1553 (Sig.) TP1554 (GND) (Located on the main PWB)
Control	VR101 RF AGC control (Located on IF PACK)
Specification	Just before shrinking (See Figure 5-9)

1. Have the unit received good TV commercial broadcast reception.  
(Input field strength: 85 dB $\mu$ V of antenna terminal.)
2. Connect an oscilloscope to test points TP1553 (Sig.) TP1554 (GND).
3. Observe the video output terminal waveform on the oscilloscope.  
Adjust VR101 (RF AGC control) in the IF pack until the noise disappears from the oscilloscope screen and the waveform nearly comes into sync.

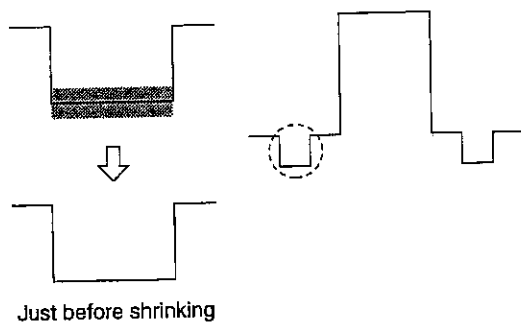


Figure 5-11.

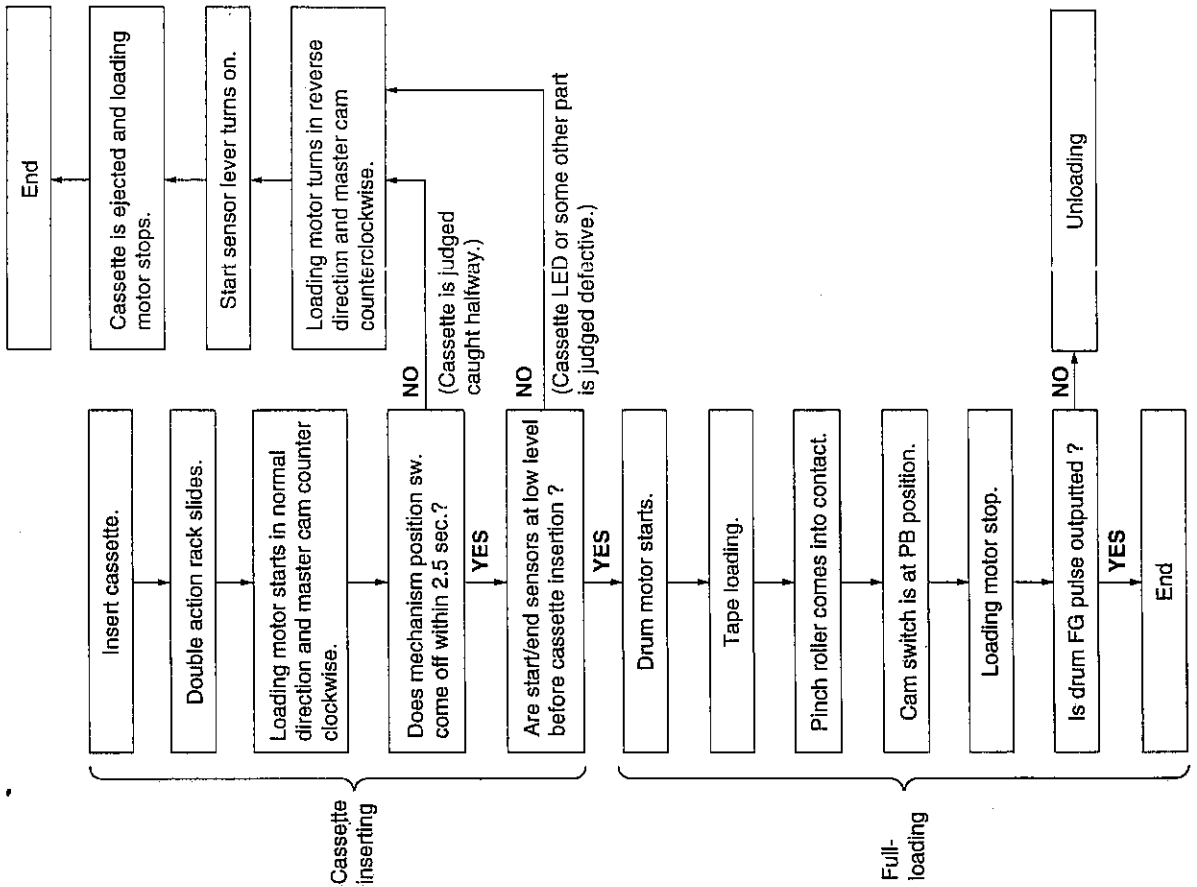
### CHECKING OF TUNER AUDIO LEVEL

1. Make weighting comparison of the sound volume between in the TV Through mode and in the VCR E-E mode to see if the volume is the same as each other.
2. If the volume is not equal, turn the VR102 control on the IF pack to reach the same volume level.

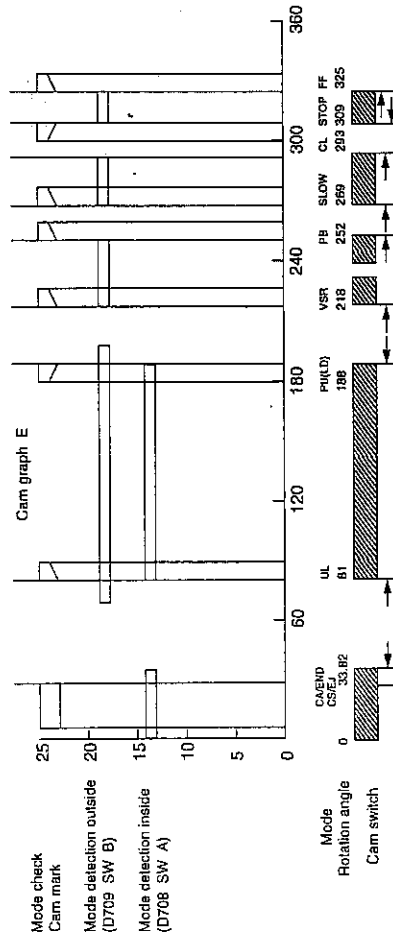
## 6. MECHANISM OPERATION FLOWCHART AND TROUBLESHOOTING GUIDE

### MECHANISM OPERATION FLOWCHART

\* This flowchart describes the outline of the mechanism's operation, but does not give its details.



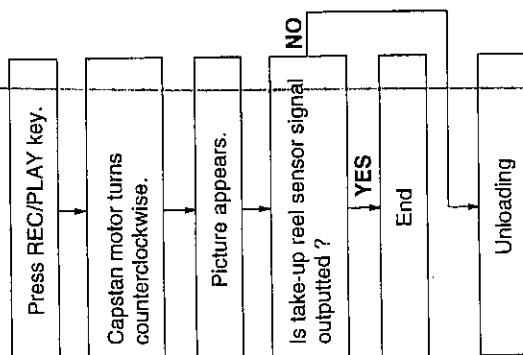
### F mechanical timing



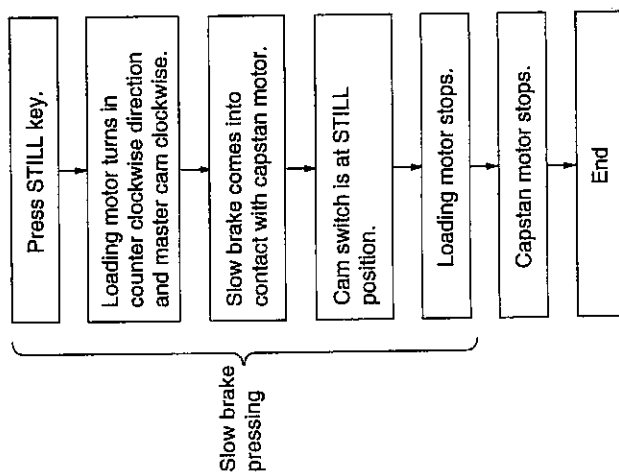
Mode	CS/EJ	PU/D	VSR	CL	STOP	FF
Mode detection outside	0	0	0	0	0	0
Mode detection inside	1	0	1	1	0	1
S sensor	1	1	0	1	1	0
S sensor open	0	0	0	0	0	0
S sensor close	1	1	1	1	1	1

	Mode detection inside Sensor A	Mode detection outside Sensor B
CS/EJ	1	0
PU/D	1	1
VSR	0	1
PB	0	0
STILL	0	1
CL	0	0
STOP	0	0
FF	0	0

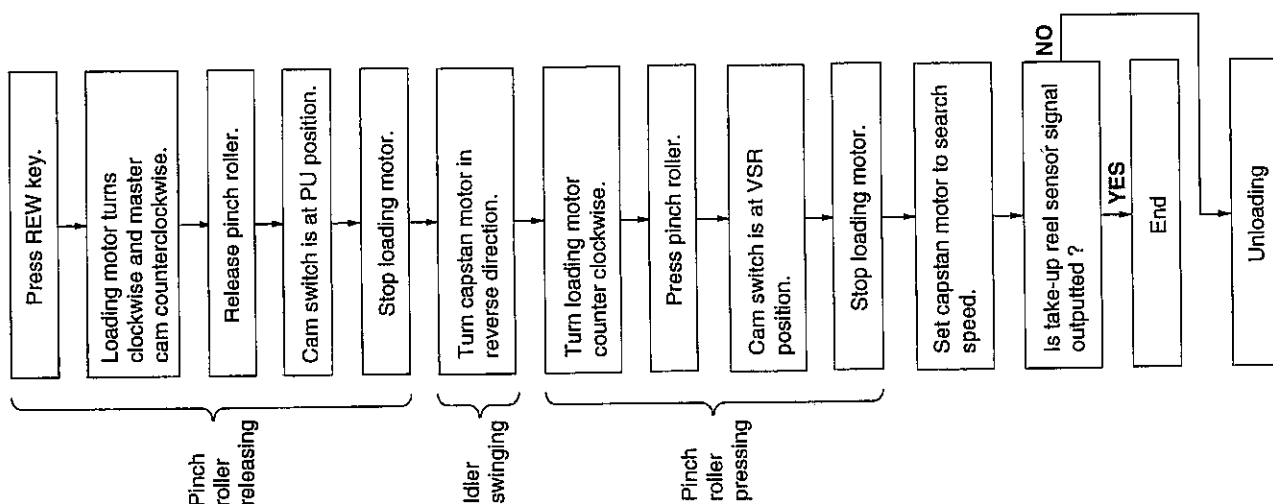
STOP → REC/PLAY



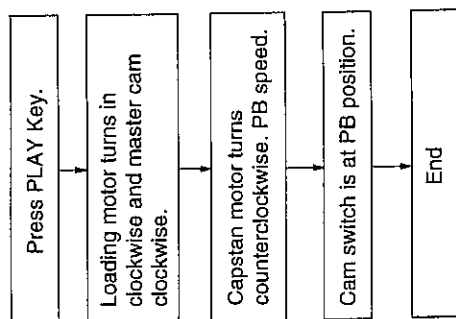
PLAY → STILL



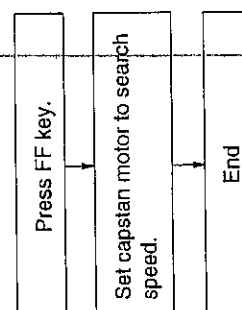
PLAY → VSR



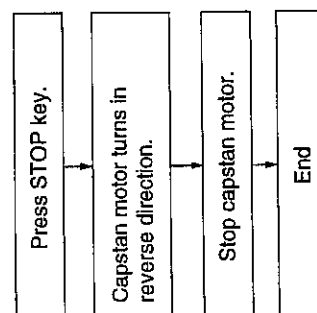
VSR → PLAY

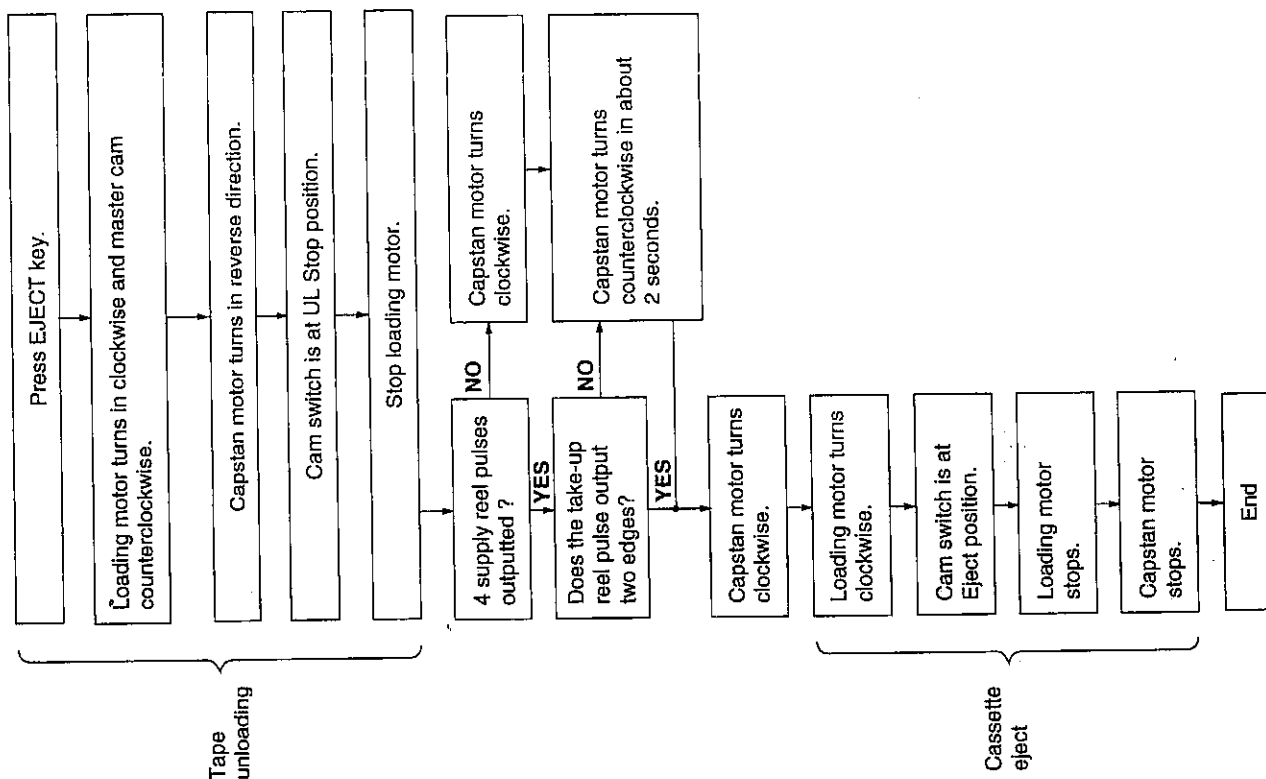
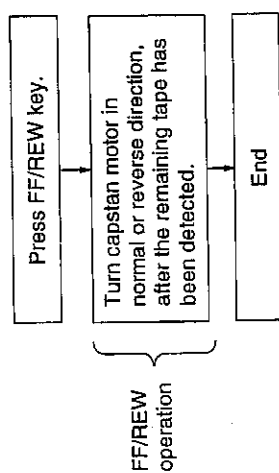
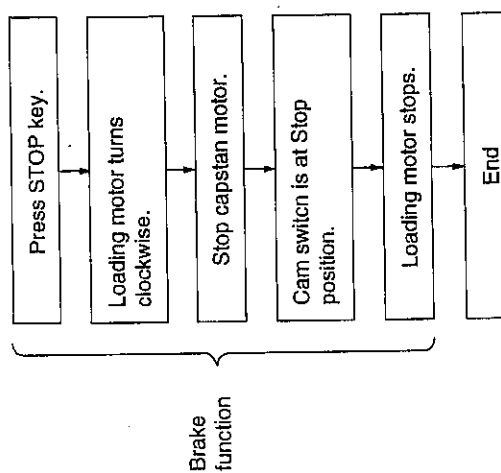


PLAY → VSF

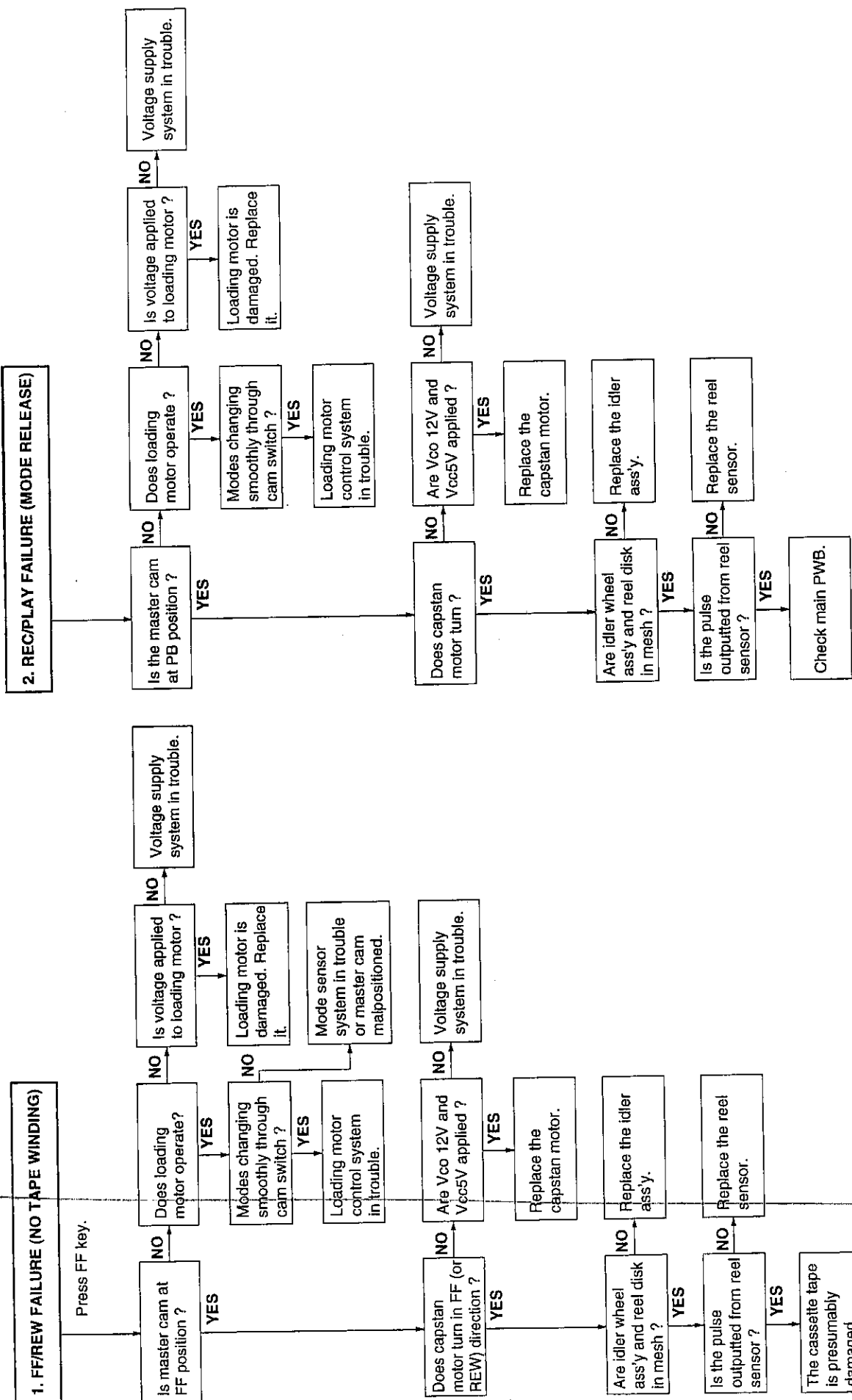


REC/PLAY → STOP

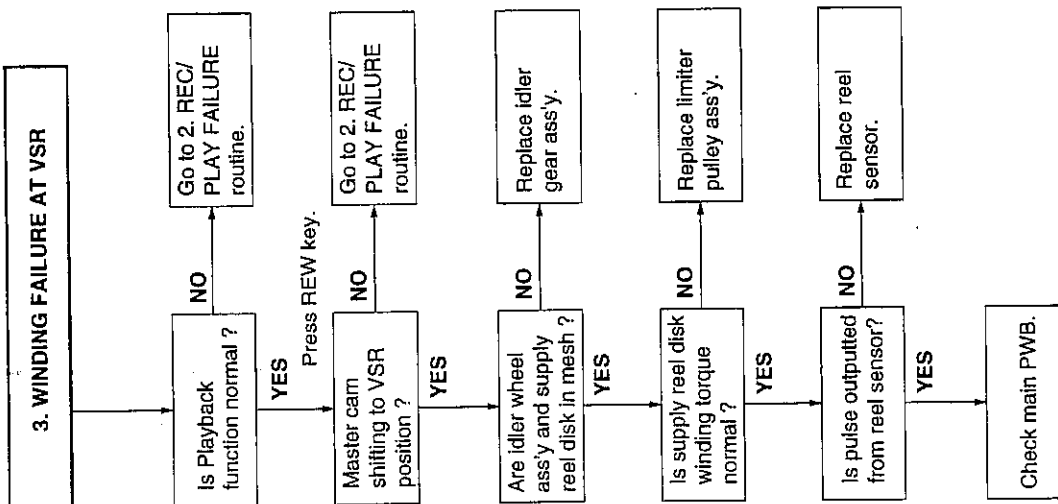
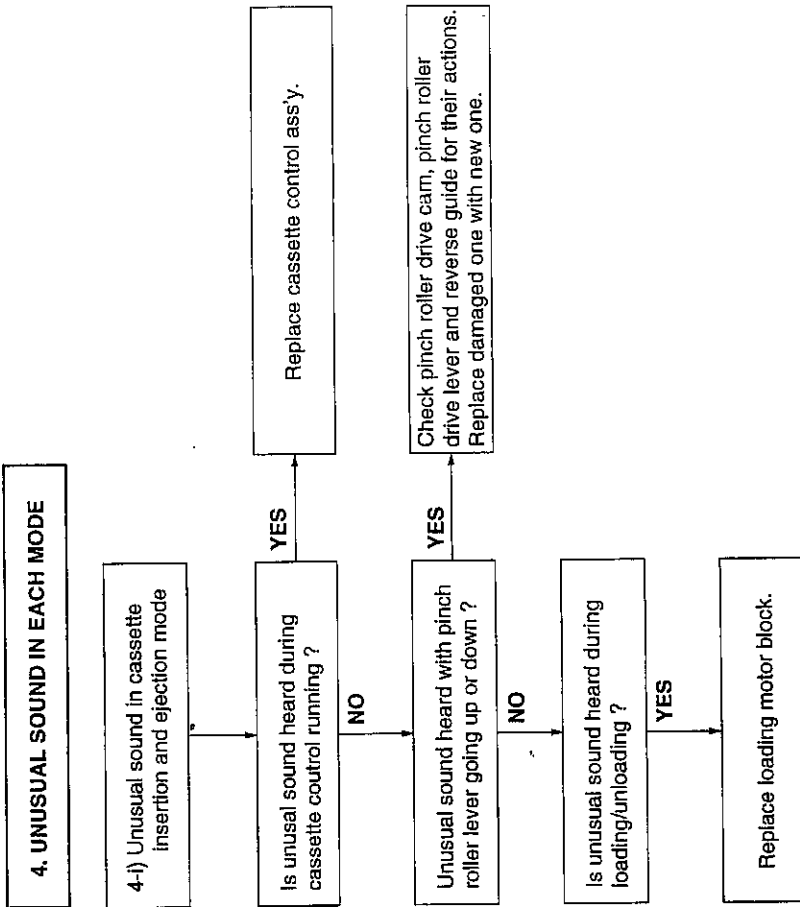


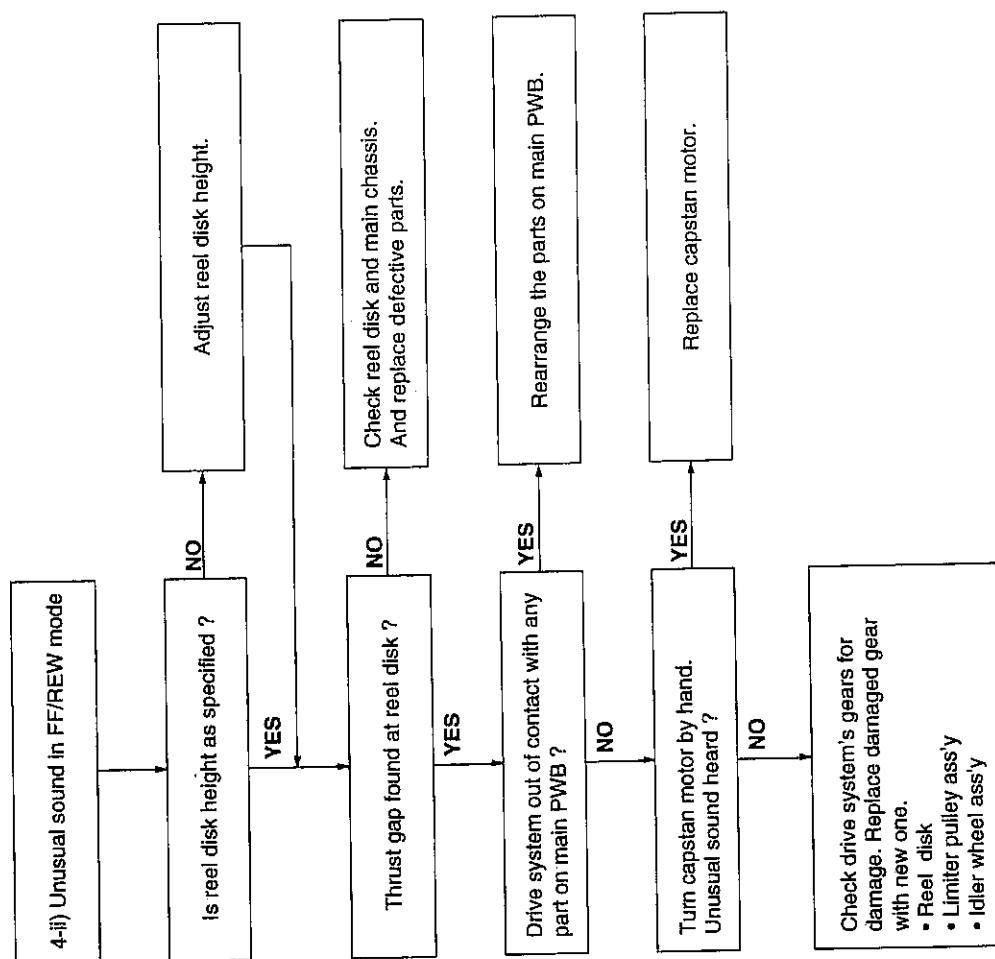
STOP → CASSETTE EJECTSTOP → FF/REWFF/REW → STOP

MECHANISM TROUBLESHOOTING



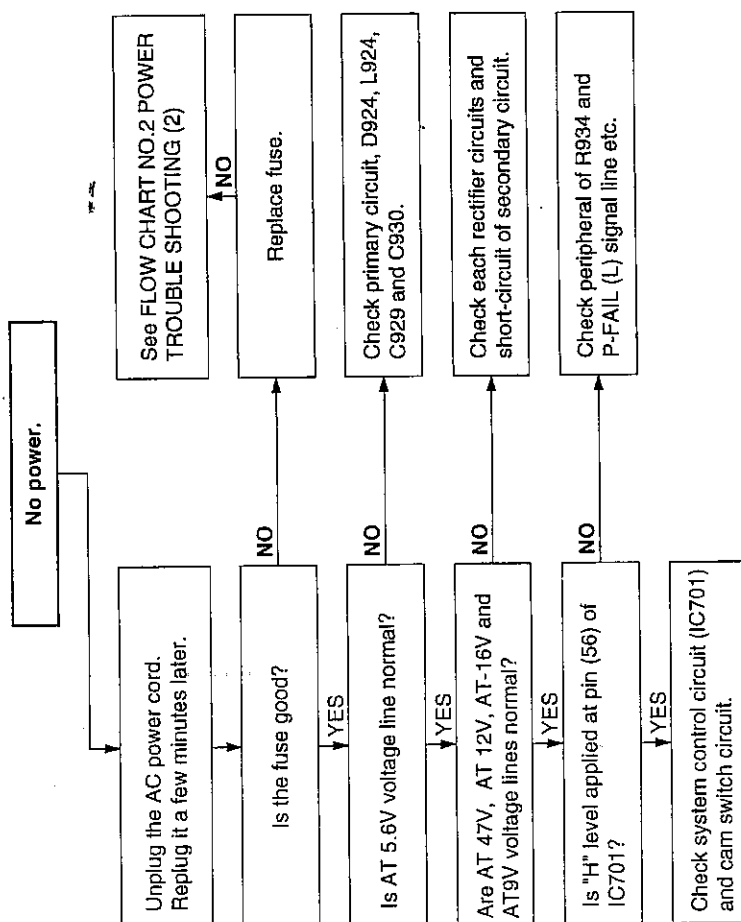




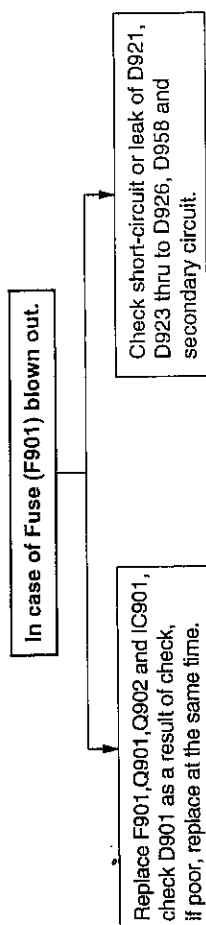


## 7. TROUBLESHOOTING

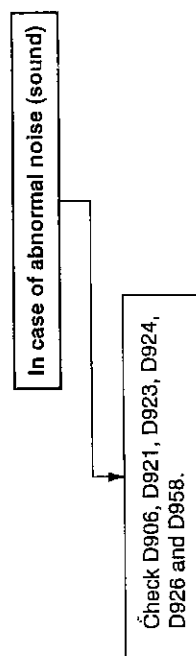
FLOW CHART NO.1 POWER TROUBLESHOOTING (1)



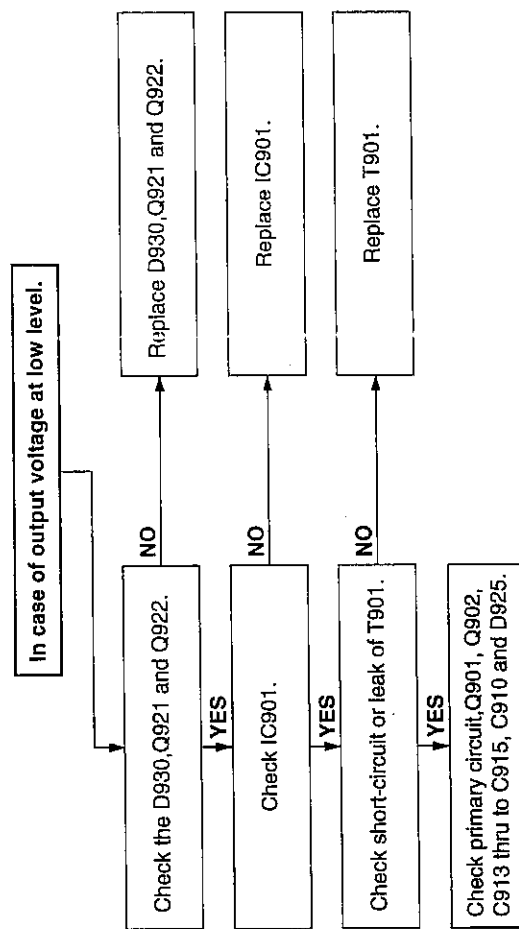
FLOW CHART NO.2 POWER TROUBLESHOOTING (2)



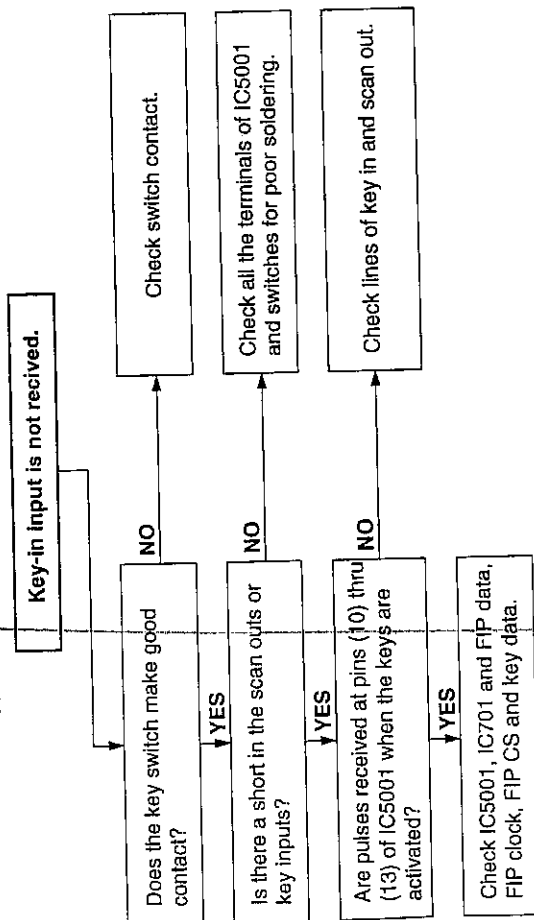
FLOW CHART NO.3 POWER TROUBLESHOOTING (3)



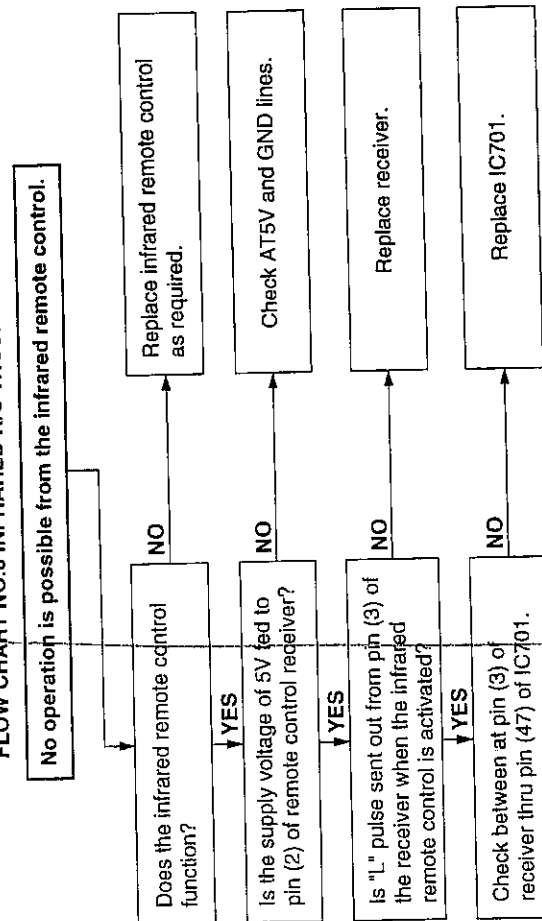
FLOW CHART NO.4 POWER TROUBLESHOOTING (4)



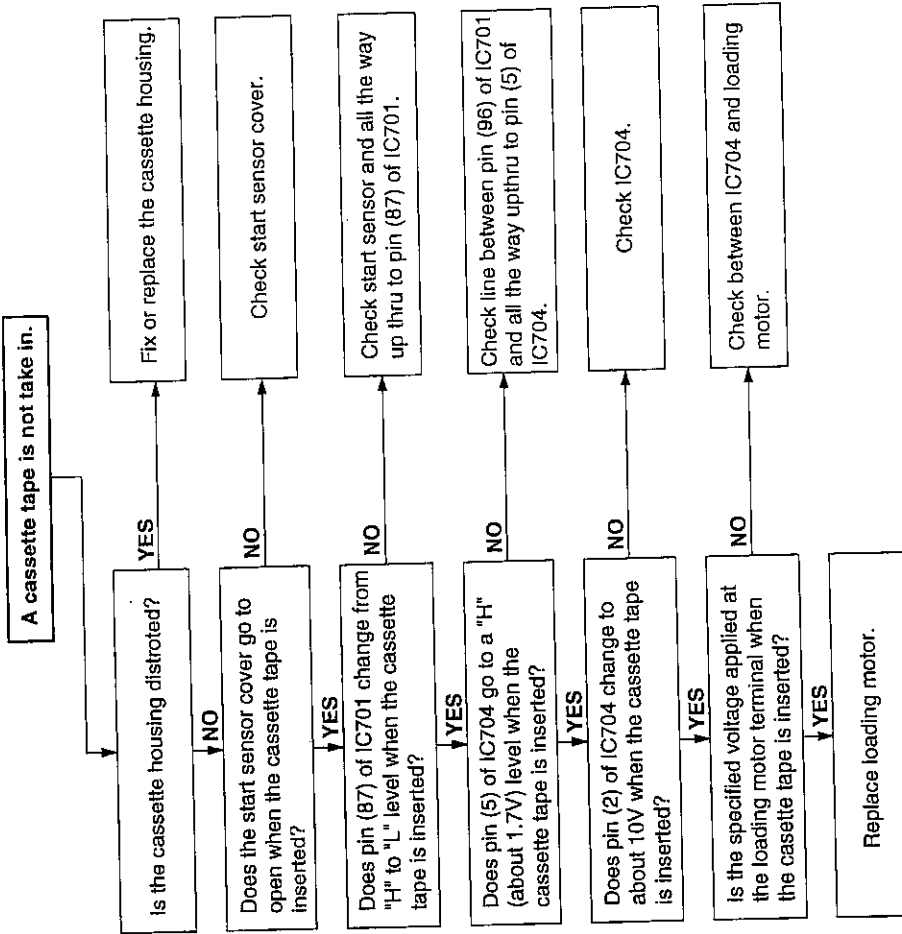
FLOW CHART NO.5 TIMER TROUBLESHOOTING



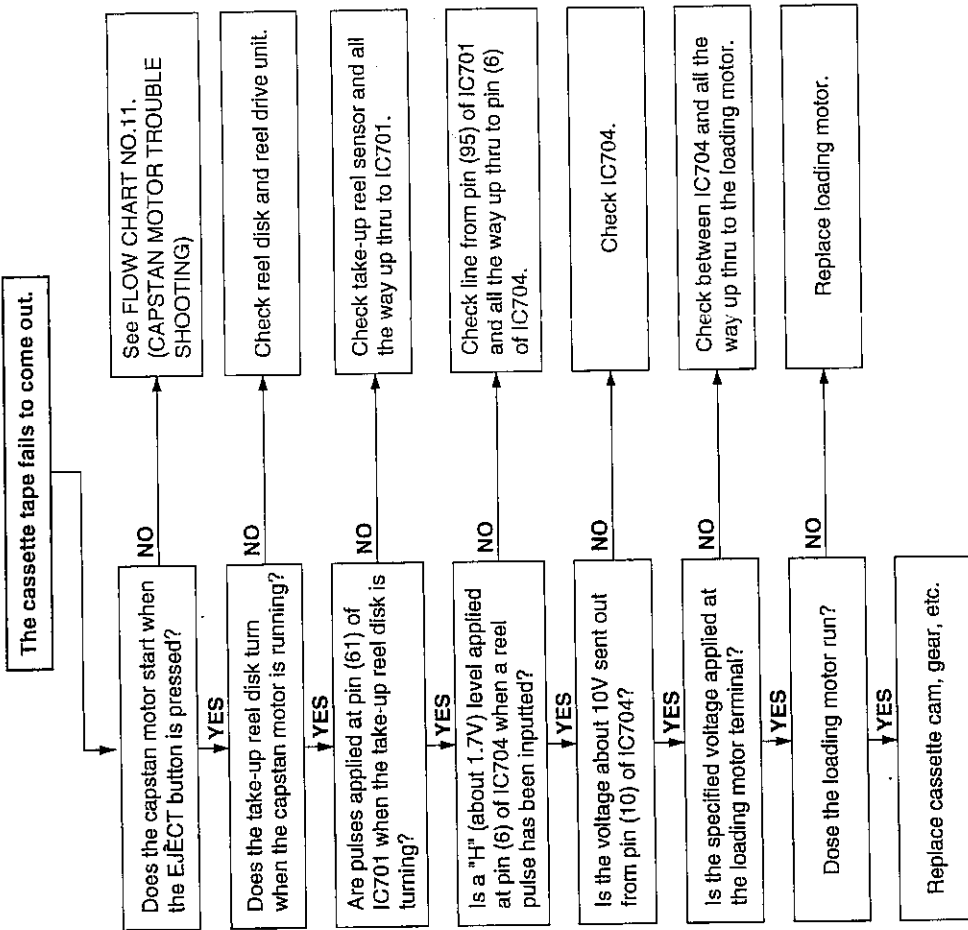
FLOW CHART NO.6 INFRARED R/C TROUBLESHOOTING



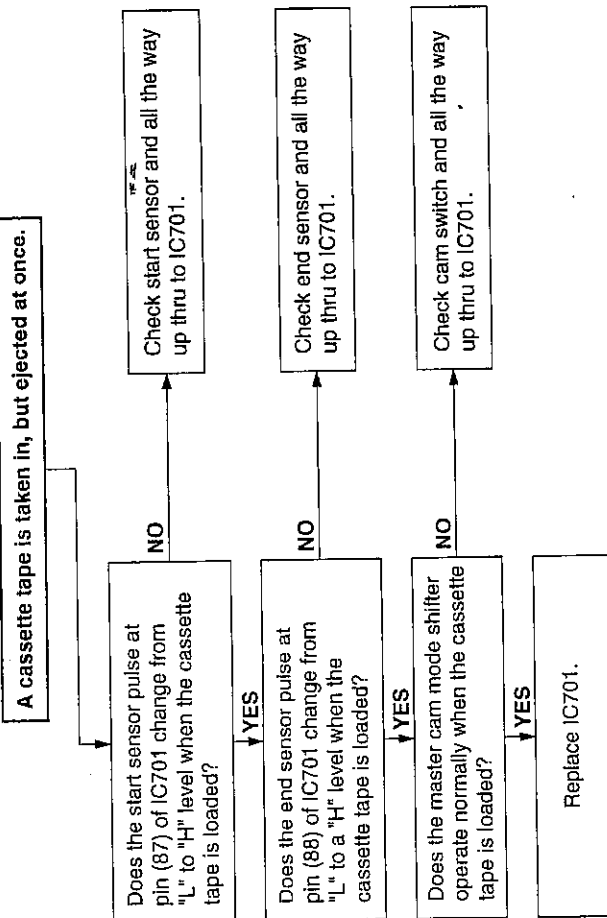
FLOW CHART NO.7 CASSETTE CONTROL TROUBLESHOOTING(1)



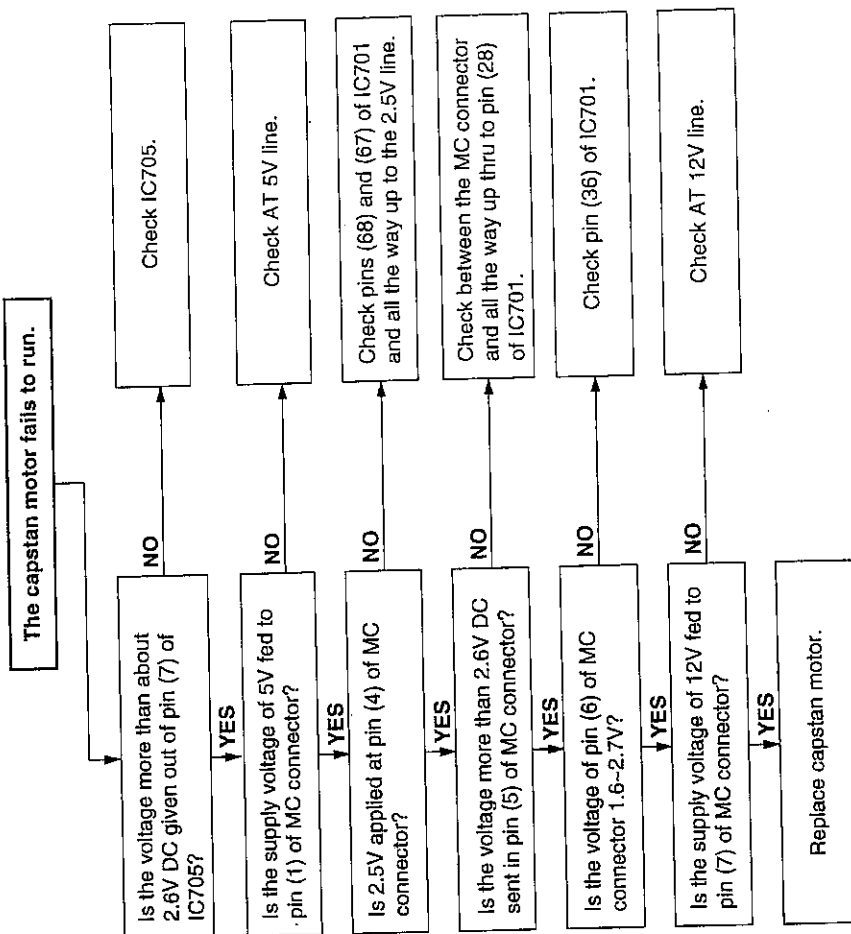
FLOW CHART NO.9 LOADING MOTOR AND EJECT TROUBLESHOOTING



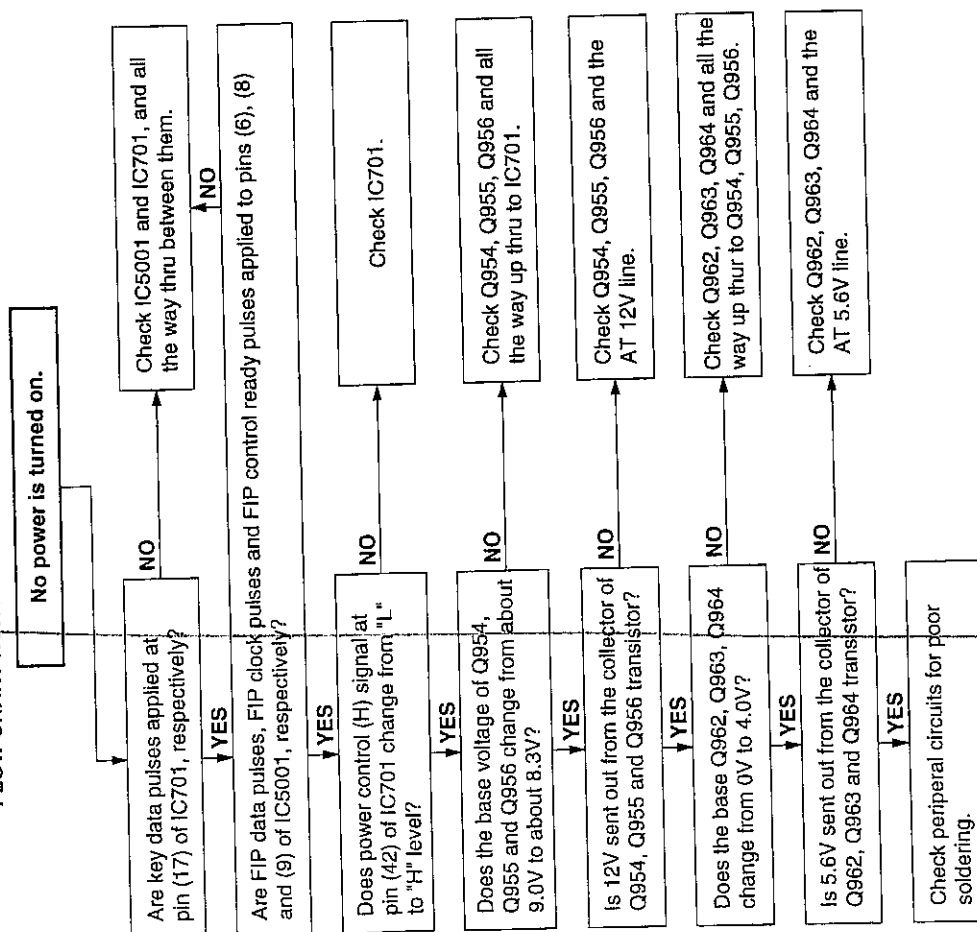
FLOW CHART NO.8 CASSETTE CONTROL TROUBLESHOOTING (2)



FLOW CHART NO.11 CAPSTAN MOTOR TROUBLESHOOTING

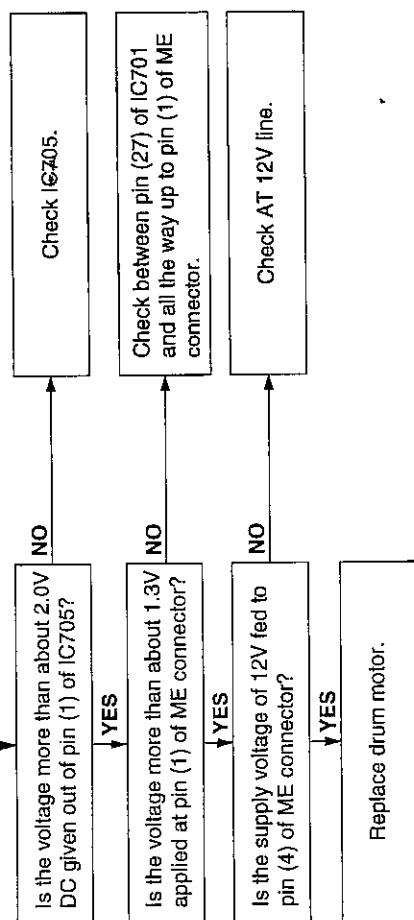


FLOW CHART NO.10 SYSTEM CONTROL TROUBLESHOOTING



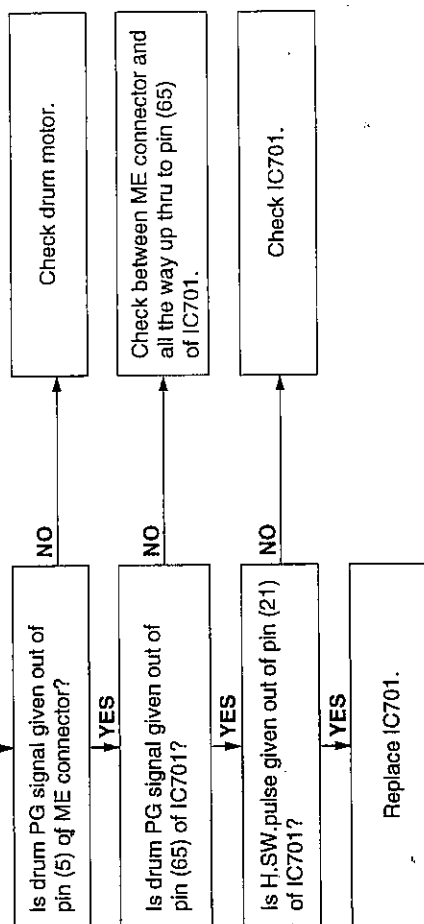
FLOW CHART NO.12 DRUM MOTOR TROUBLESHOOTING (1)

The drum motor fails to run.

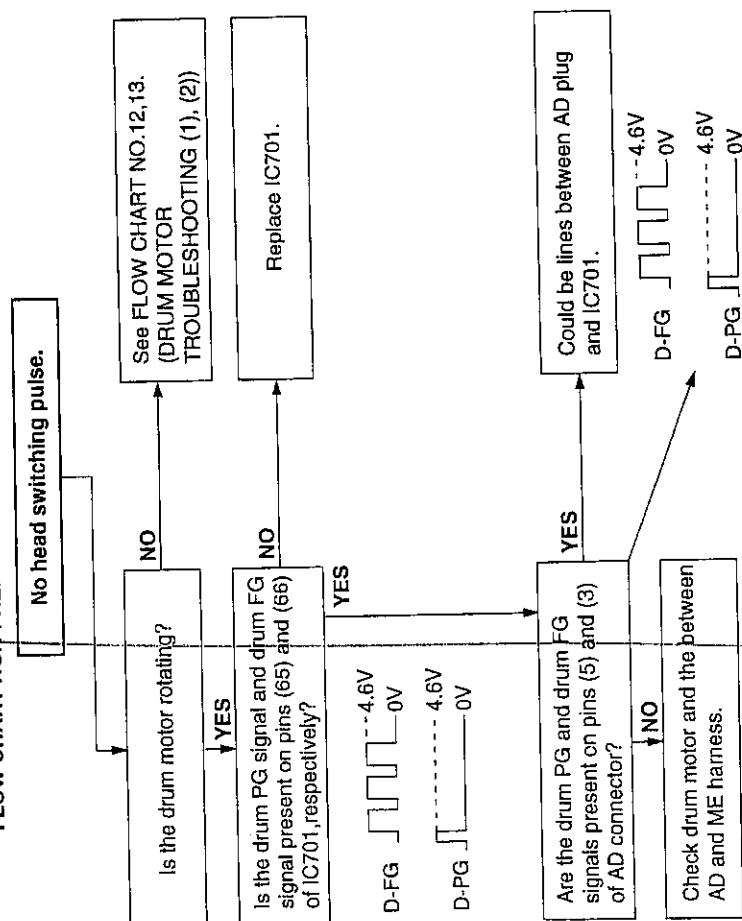


FLOW CHART NO.13 DRUM MOTOR TROUBLESHOOTING (2)

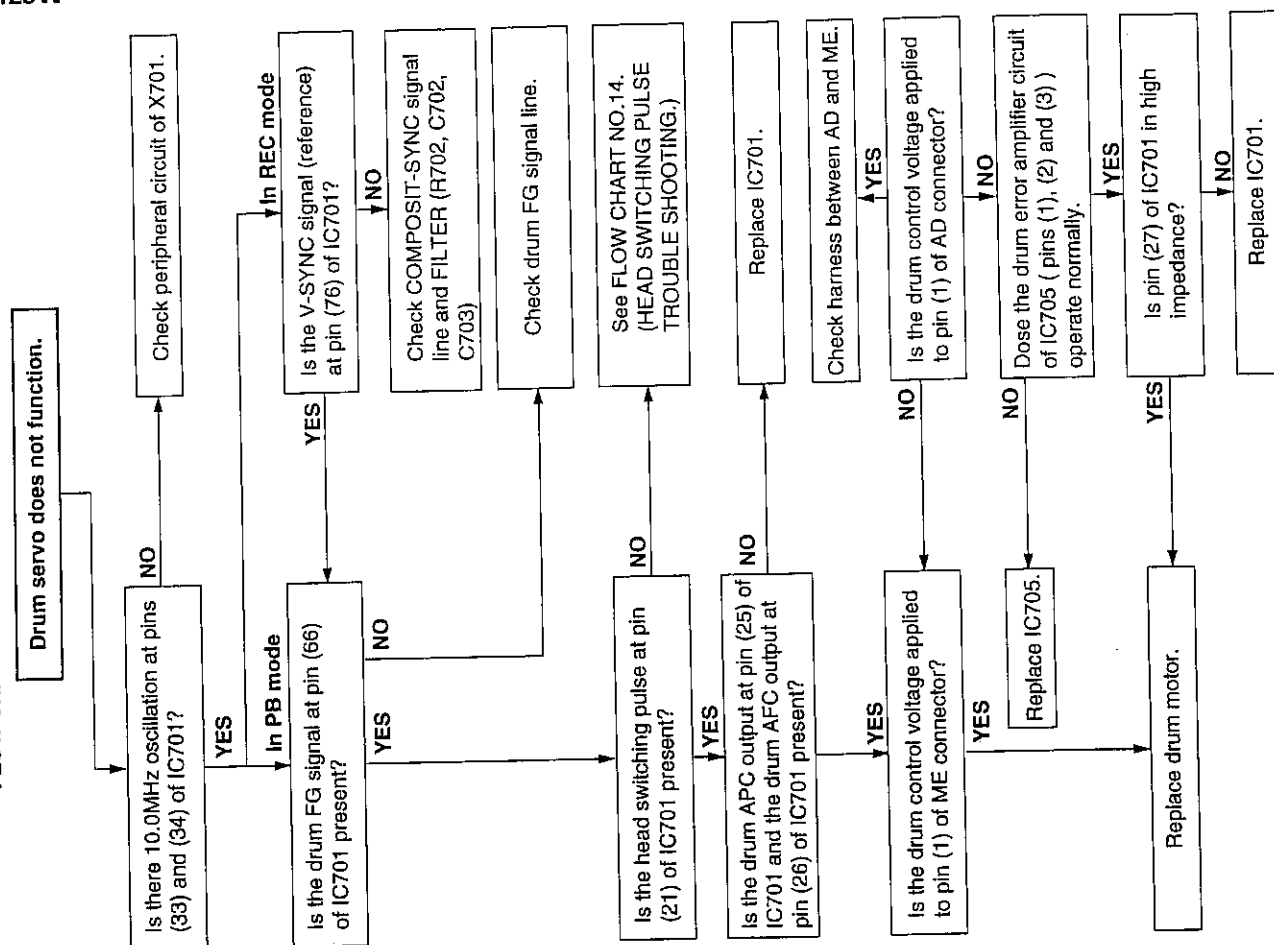
The drum motor runs only for a few seconds.



FLOW CHART NO. 14 HEAD SWITCHING PULSE TROUBLESHOOTING.



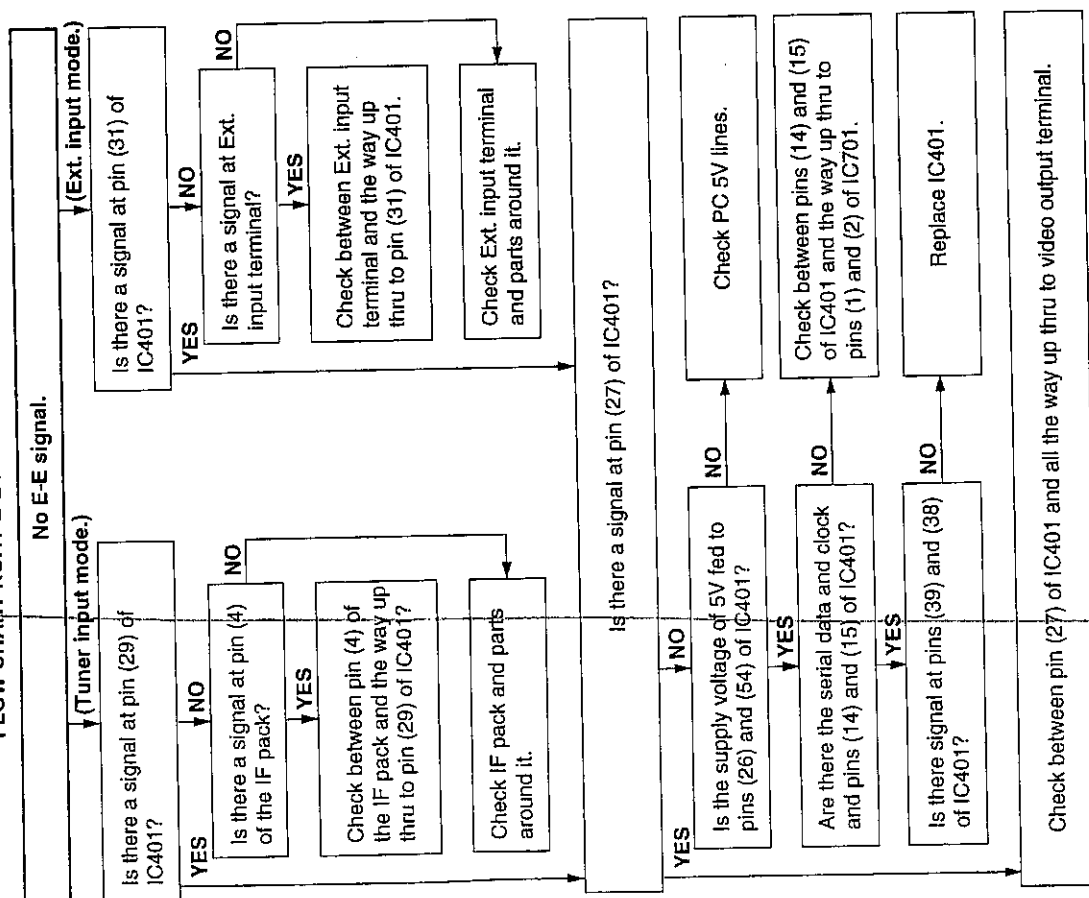
FLOW CHART NO. 15 DRUM SERVO TROUBLESHOOTING



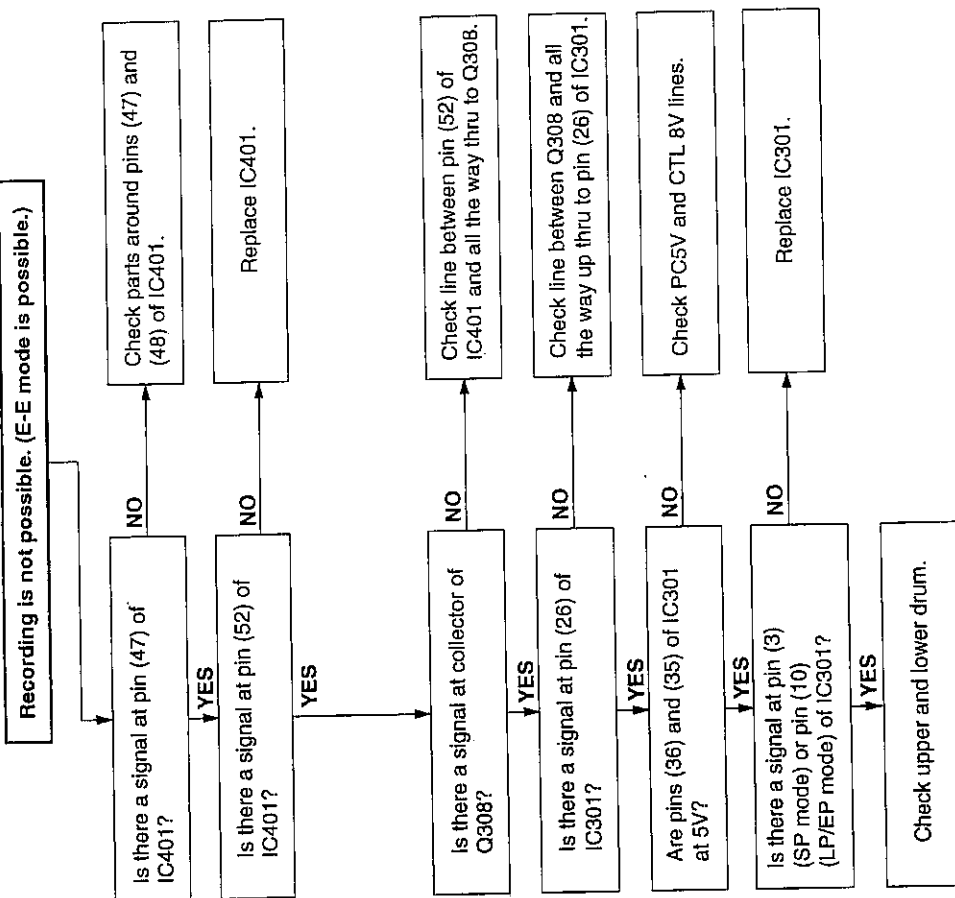




FLOW CHART NO.17 E-E MODE TROUBLESHOOTING

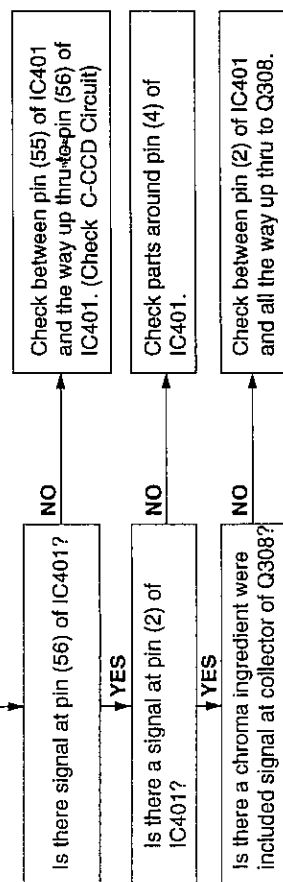


FLOW CHART NO.18 RECORDING MODE (LUMINANCE) TROUBLESHOOTING



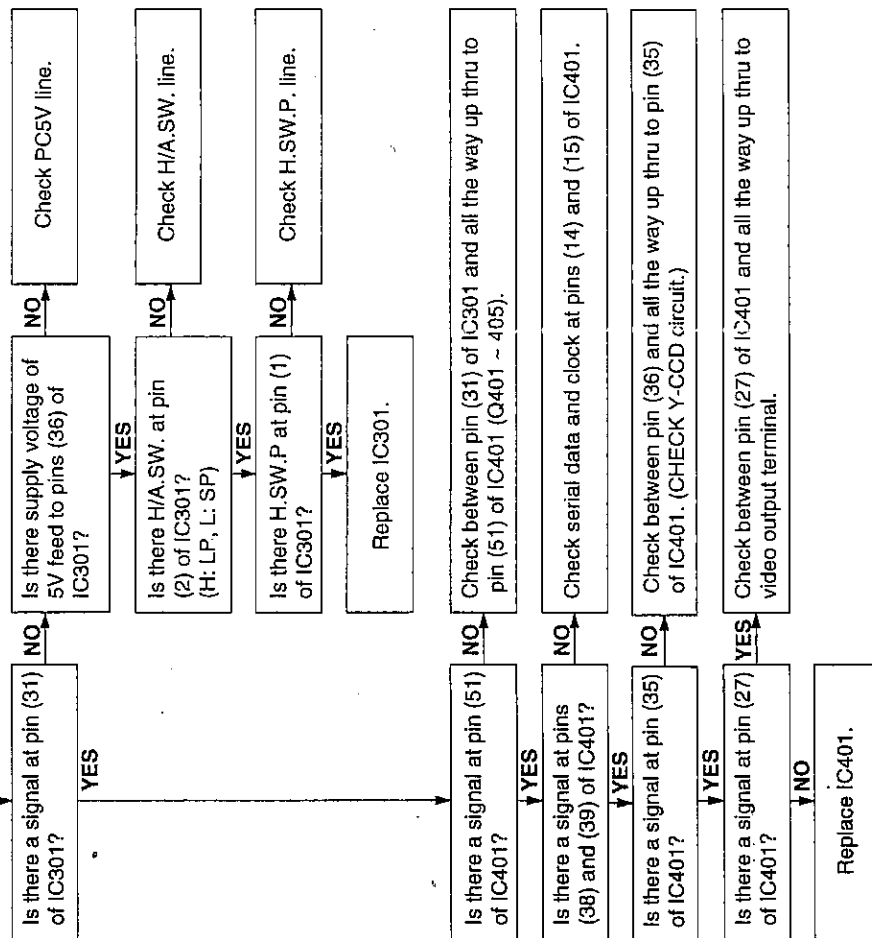
## FLOW CHART NO. 19 RECORDING MODE (CHROMA) TROUBLESHOOTING

Recording is possible but without color. (E-E mode is possible.)

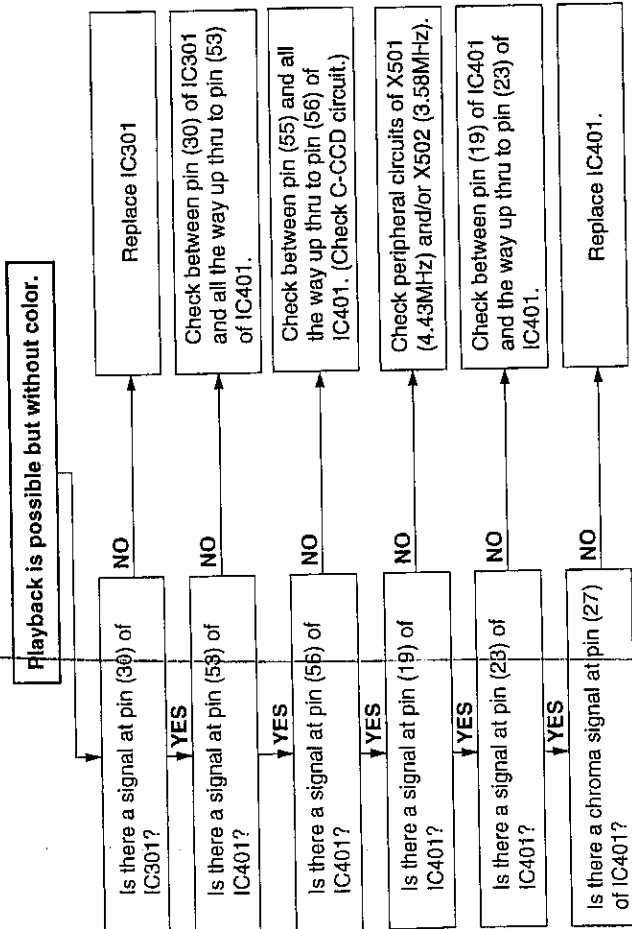


## FLOW CHART NO. 20 PLAYBACK MODE (LUMINANCE) TROUBLESHOOTING

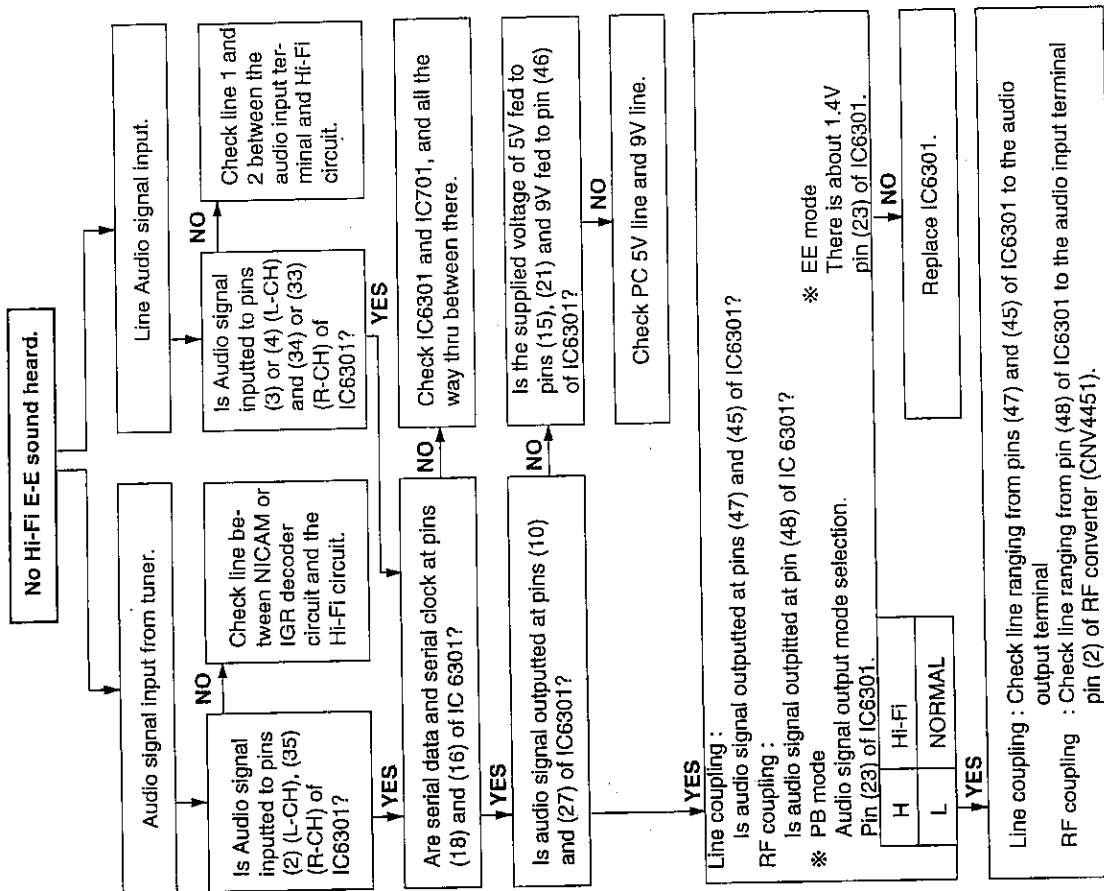
Playback is not possible.



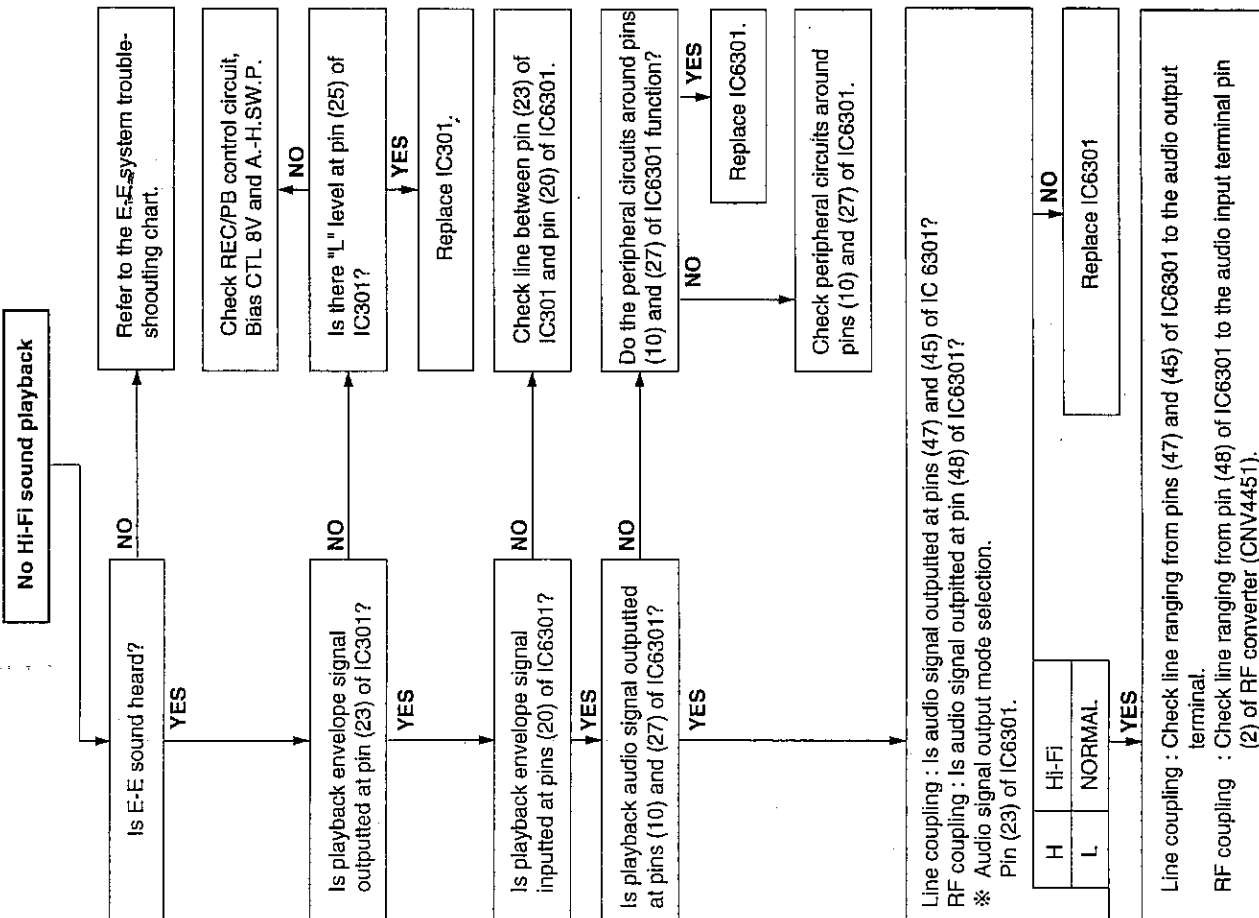
FLOW CHART NO.21 PLAYBACK MODE (CHROMA) TROUBLESHOOTING



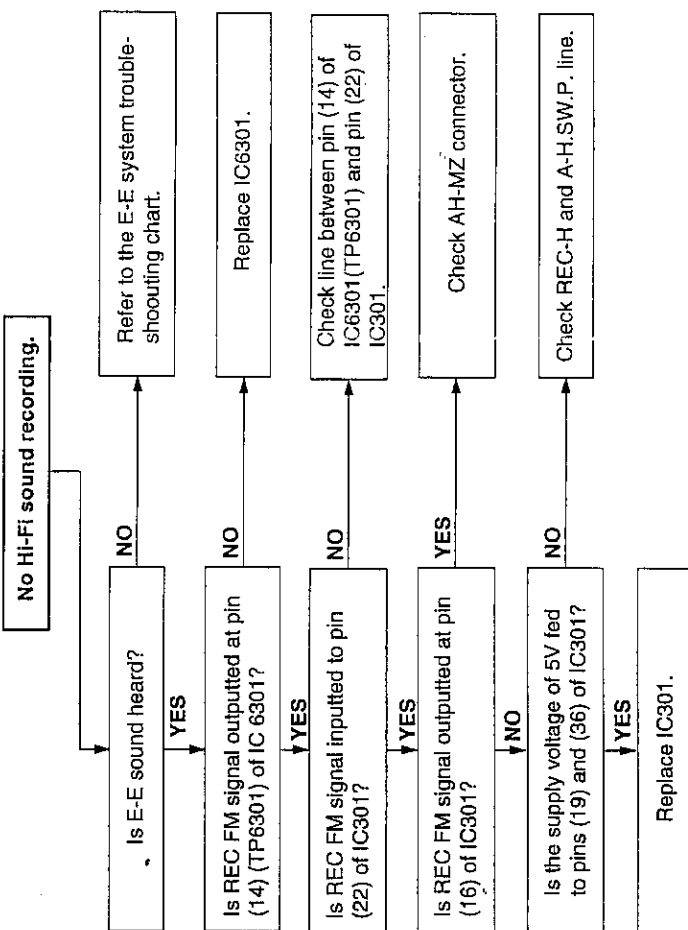
FLOW CHART NO.22 HI-FI TROUBLESHOOTING (1)



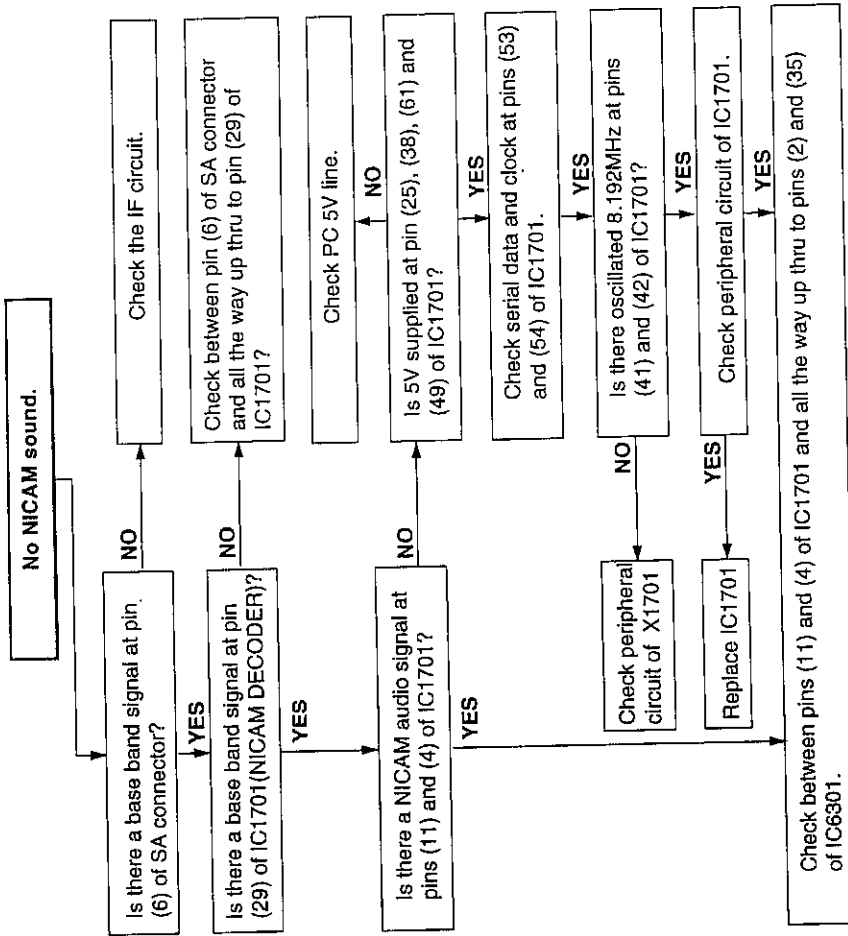
FLOW CHART NO.23 HI-FI TROUBLESHOOTING (2)



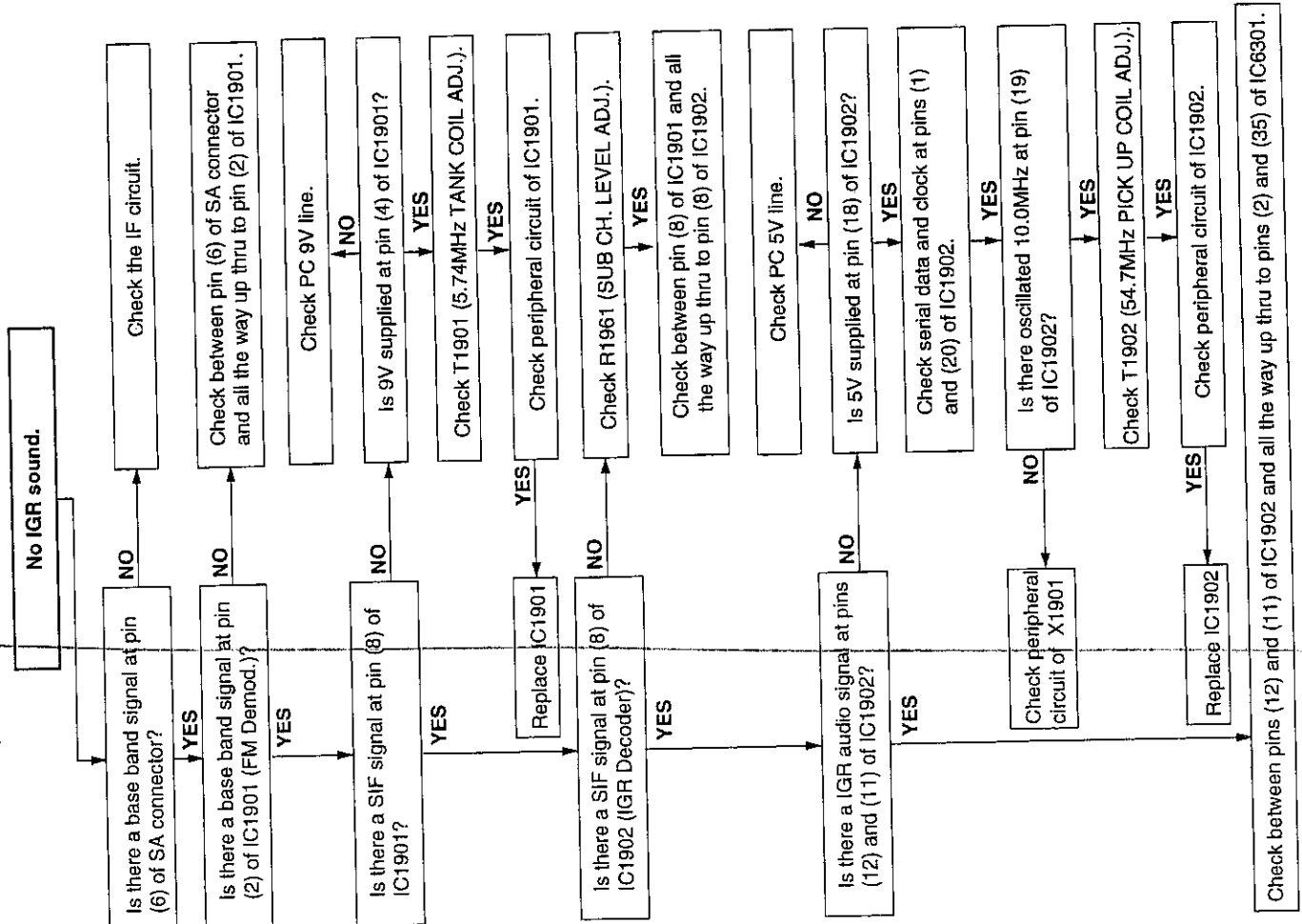
FLOW CHART NO.24 HI-FI TROUBLESHOOTING (3)



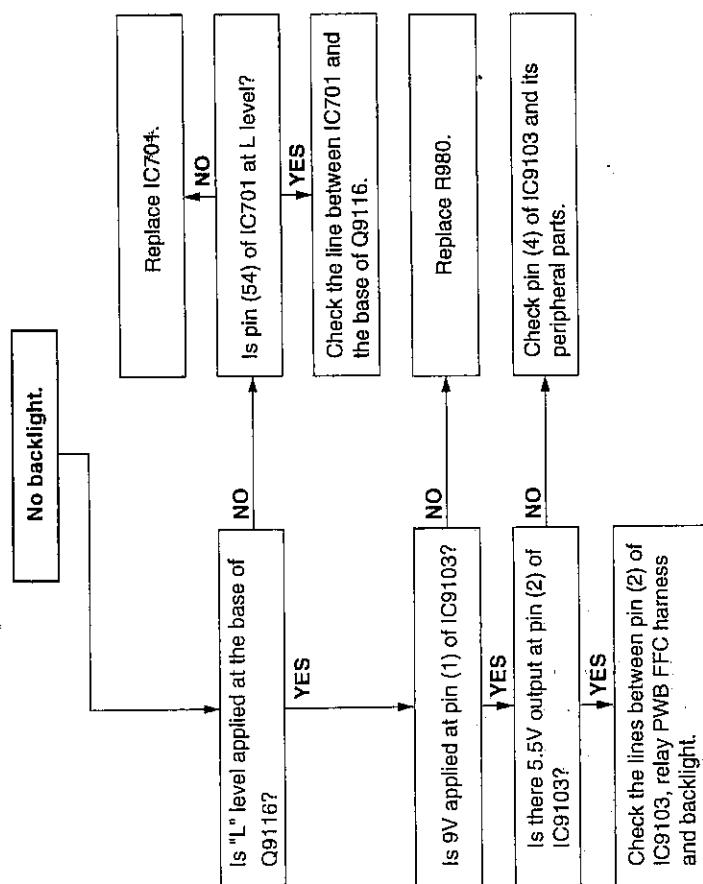
FLOW CHART NO.26 NICAM TROUBLESHOOTING



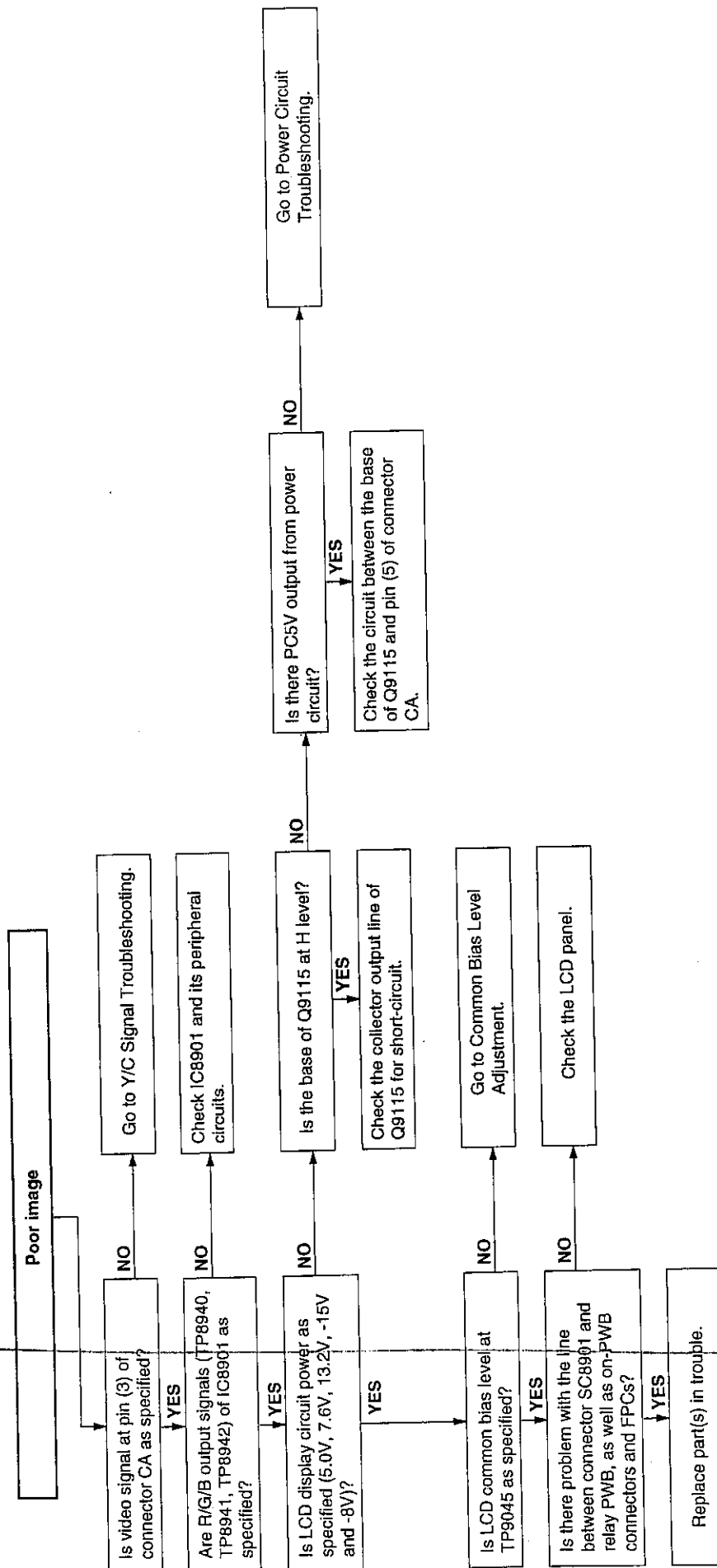
FLOW CHART NO.25 IGR TROUBLESHOOTING



FLOW CHART NO.27 LCD TROUBLESHOOTING (1)

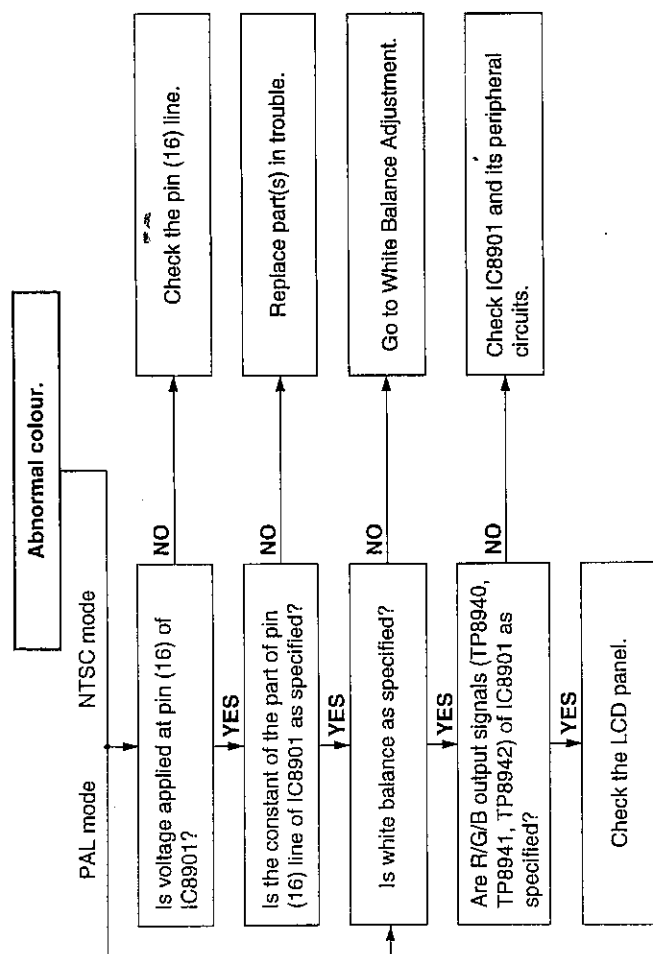


Backlight voltage	5 seconds at start About 7.6V	Normally About 5.4V
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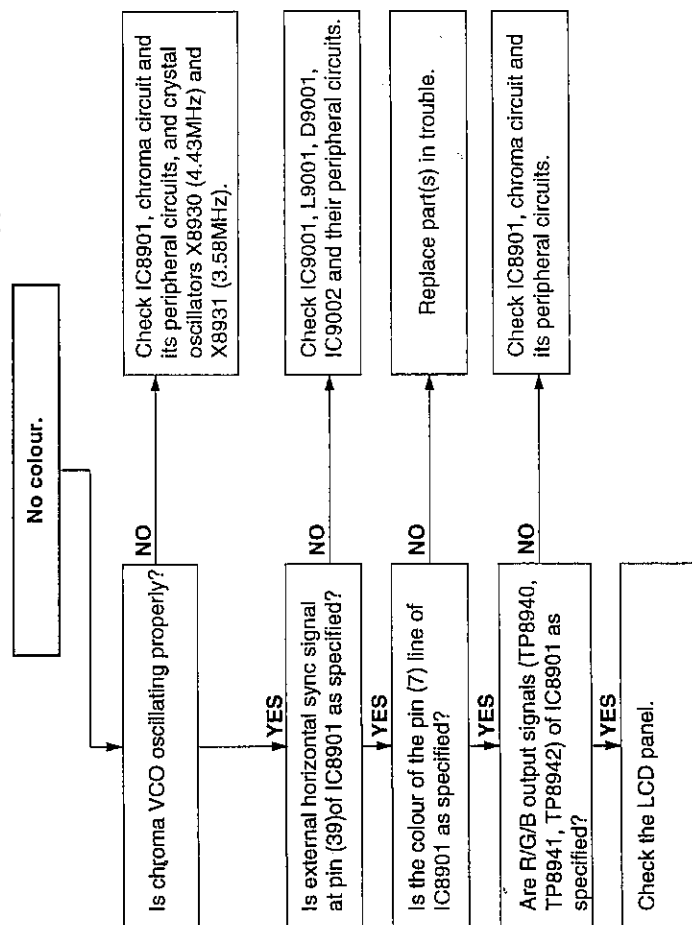




FLOW CHART NO.29 LCD TROUBLE SHOOTING (3)

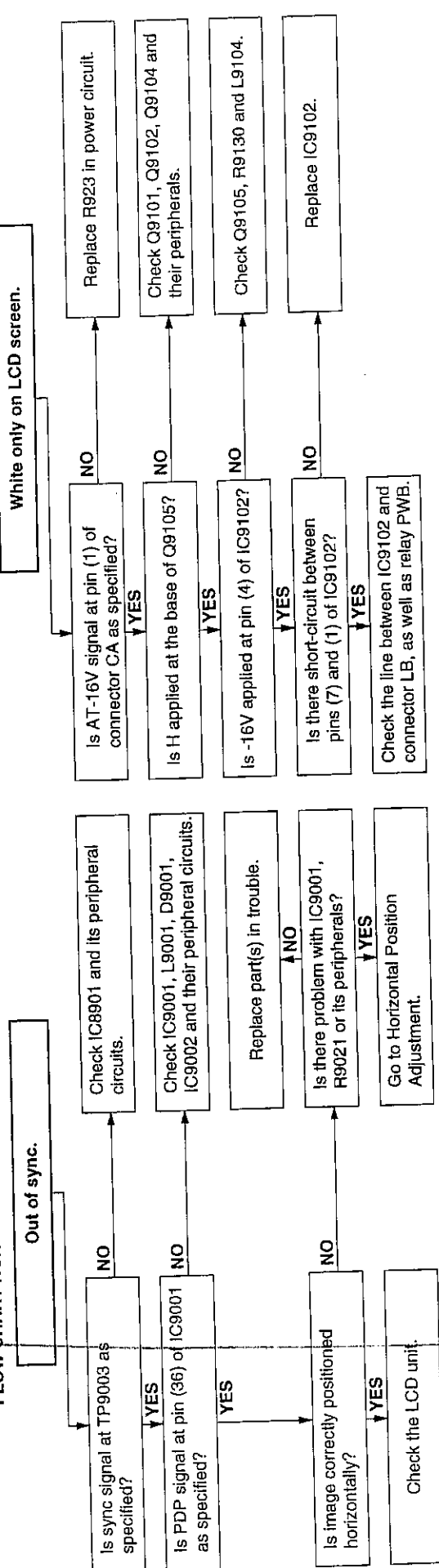


FLOW CHART NO.30 LCD TROUBLESHOOTING (4)

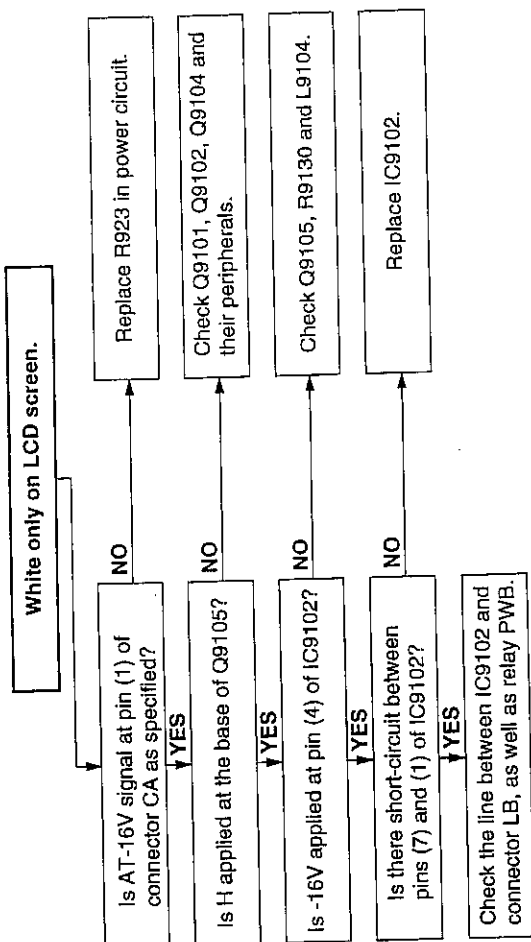


Note: The LCD gives colours in the PAL and NTSC3.58 modes. In the SECAM, NTSC4.43 and NTSC NT-PAL TV modes, however, the unit does not give any colours.

FLOW CHART NO.31 LCD TROUBLESHOOTING (5)



FLOW CHART NO.32 LCD TROUBLESHOOTING (6)



## REPLACEMENT OF IC703 (E<sup>2</sup>PROM)

### «Servicing precautions»

When the IC703 (EEPROM) has been replaced, it is necessary to program the memory again.

1. Set the unit to the power off mode (power on standby).
2. Make an instantaneous short-circuit between TP5001 and TP5002 on the operation PWB. Make sure the REC LED and the timer LED lights up. The unit is now in the test mode and Jumper No. (JP-0) appears on the LCD screen.
3. Using the channel (+) and (-) buttons, enter the JP-0 thru JP-31 function numbers (displayed on the LCD screen) on the EEPROM map sequentially. Press the DISPLAY button to turn on a selected function, or the CLEAR button to turn it off.
  - \* When the DISPLAY button is pressed, the memory function turns on and the REC LED and the timer LED go out.
  - \* When the CLEAR button is pressed, the memory function turns off and the REC LED and the timer LED light up.
4. Go through the JP-1 to JP-31 entries. Make an instantaneous short-circuit between the test points TP5001 and TP5002 again in order to bring the unit back to the normal mode (clock display).

	No.	FUNCTION	ML3/ML3W/NL3	MH330				
T I M E R	JP0	COROUR 0	0	0				
	1	COROUR 1	0	0				
	2	VPS PDC	0	0				
	3	SPATIALIZER	0	1				
	4	VCR 0	0	0				
	5	VCR 1	0	0				
	6	SYSTEM 0	1	1				
	7	SYSTEM 1	1	1				
	8	R/C CODE	0	1				
	9	P-IN-P	0	0				
	10	LCD	1	0				
	11	———	0	0				
	12	DUAL SCART	1	1				
	13	FRONT A/V	0	0				
	14	LP/EP	1	1				
	15	(0:00) OEM	1	1				
S Y S C O N	16	G-CODE0	1	1				
	17	G-CODE1	0	0				
	18	NICAM 0	1	1				
	19	NICAM 1	0	0				
	20	S. PICTURE	0	0				
	21	DECODER	0	0				
	22	AUTO CLOCK/SORT	0	0				
	23	Hi-Fi	1	1				
	24	HEAD0	0	1				
	25	HEAD1	1	0				
	26	NTSC SKEW	1	1				
	27	INSTANT REPLAY	1	1				
	28	———	0	0				
	29	———	0	0				
	30	———	0	0				
	31	———	0	0				

(Note: "1"; REC LED and the TIMER LED go out, "0"; REC LED and TIMER LED light up)

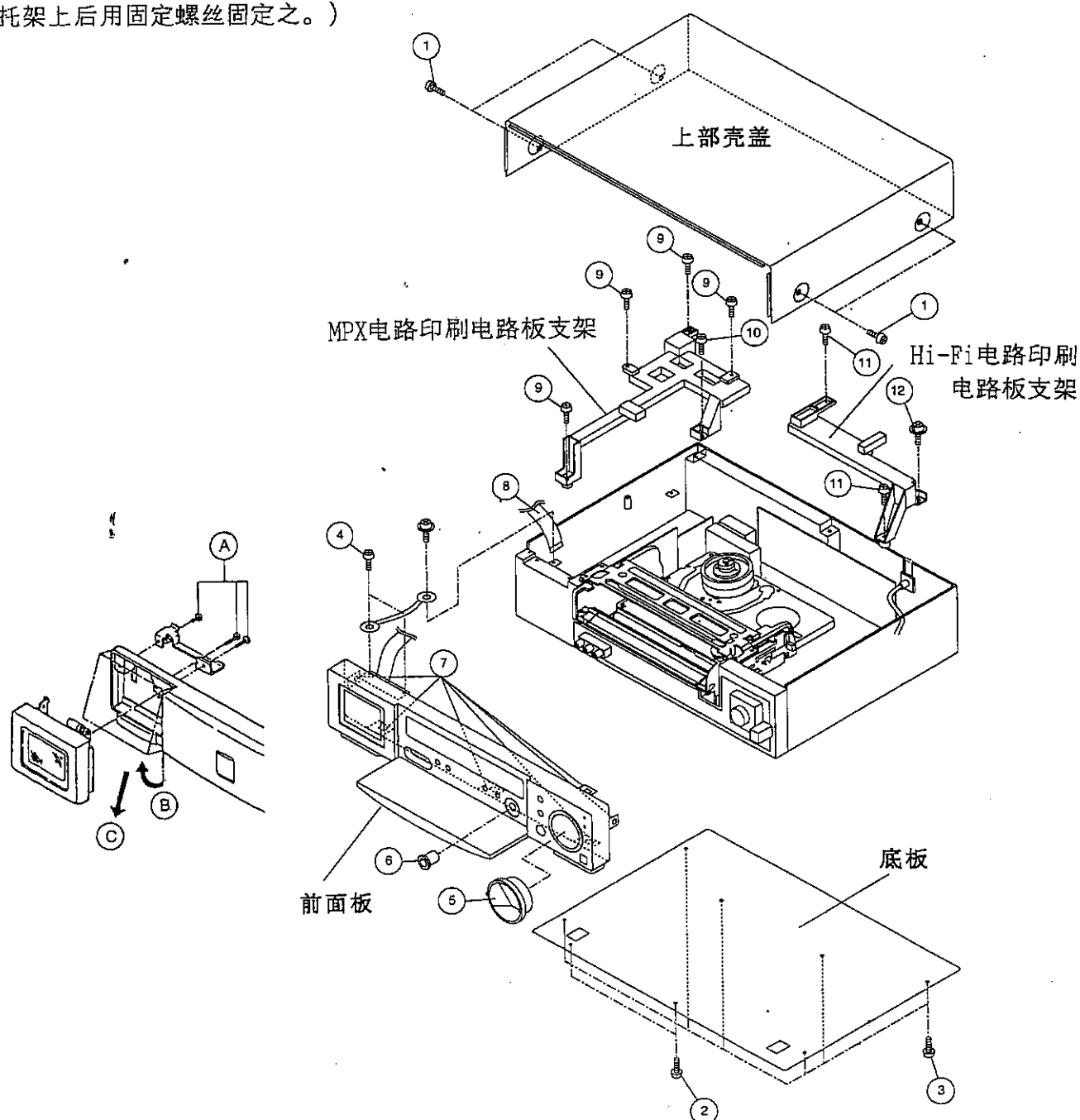
## 2. 分解和组装

## 2-1 主要部件的分解

上部壳盖 : 松去四支固定螺丝(1)  
 底板 : 松去两支固定螺丝(2)和六支固定螺丝(3)。  
 前面板 : 松去两支固定螺丝(4), 取下高速走带方向突变旋钮(5)和音量旋钮(6)。然后松去六支销卡(7), 拆下一条全平电缆(8)。

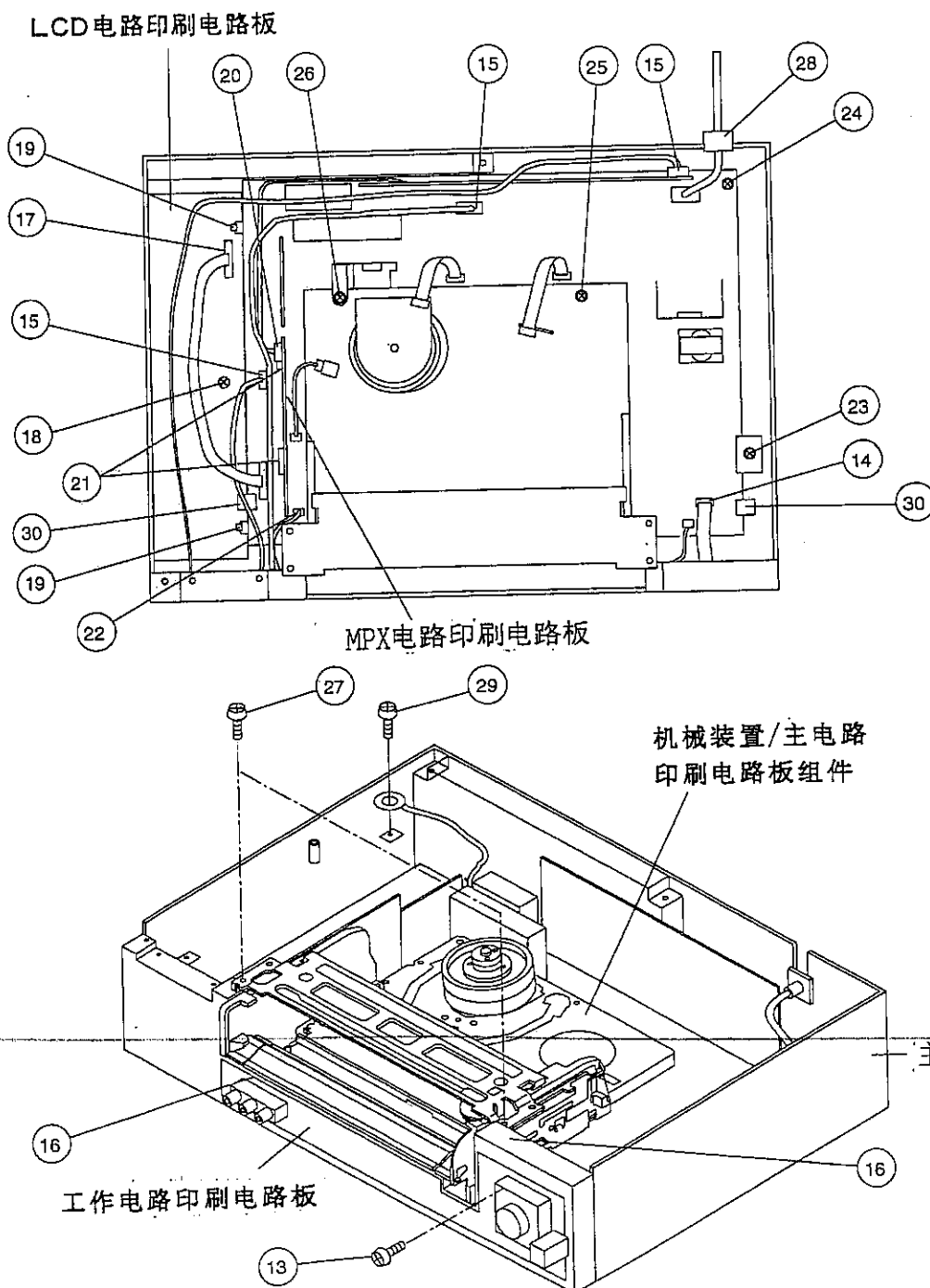
液晶显示板 : 松去三支固定螺丝(A), 打开液晶显示板下面(B) 25mm左右, 并向下(C)滑移15mm左右, 取出之。(安装时按相反步骤进行)  
 MPX电路印刷电路板 : 松去四支固定螺丝(9)和一支固定螺丝(10)。  
 支架 : 松去两支固定螺丝(11)和一支固定螺丝(12)。

(注意: 在安装时, 必须将接地线的垫圈部位于托架上后用固定螺丝固定之。)



- 工作电路印刷电路板 : 松去一支固定螺丝(13),  
拆下一条全平电缆(14)、  
三个接线器(15)及两支  
卡销(16)。
- LCD电路印刷电路板 : 取出一个接线器(17),  
松去一支固定螺丝(18)  
和两支卡销(19)。
- MPX电路印刷电路板 : 取出一个接线器(20)和  
两个接线器(21)。
- 机械装置/主电路印刷  
电路板组件 : 取出一个接线器(22),  
松去一支固定螺丝(23)、

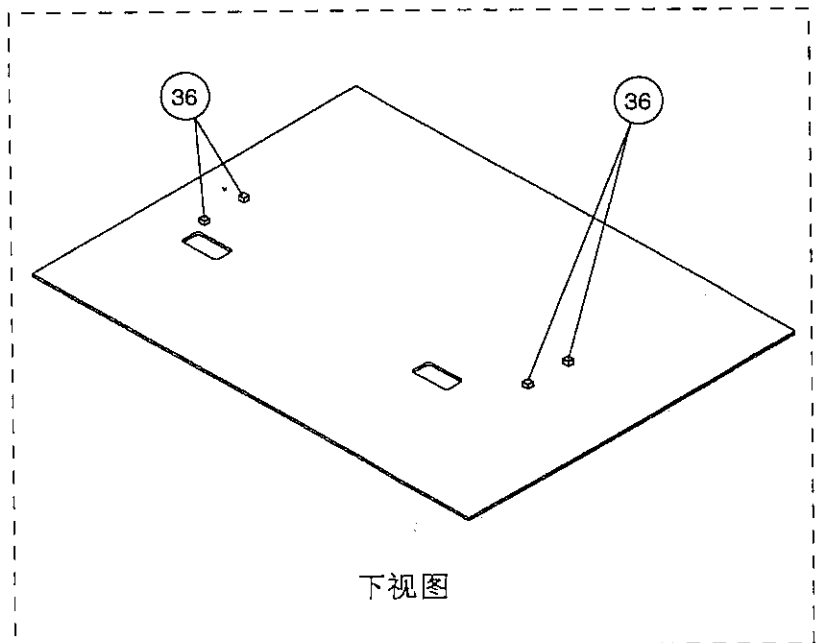
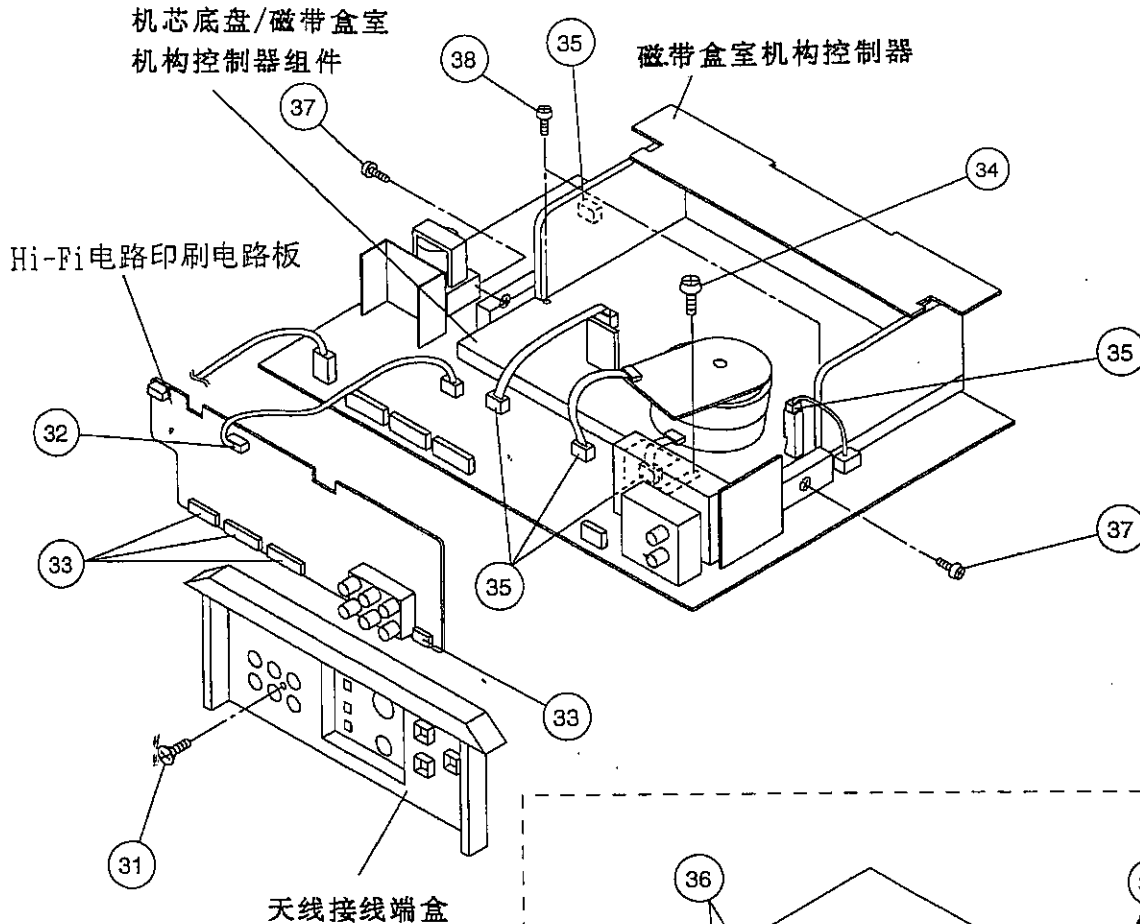
(24)、(25)、(26)及两  
支固定螺丝(27), 然后  
取出接线器(28)。松去  
一支固定螺丝(29), 拆  
下接地线, 接着拆开两  
支卡销(30)。  
将天线接线端组件提起,  
从主框架上取出机械装  
置/主电路印刷电路板  
组件。注意避免碰嗑磁  
带盒室机构控制器下部的  
录象用片状(REC TIP)  
开关。



天线接线端盒 : 松去一支固定螺丝(31)。  
Hi-Fi电路印刷电路板 : 拆下一个接线器(32)  
和四个接线器(33)。  
机芯底盘/磁带盒室  
机构控制器组件 : 松去一支固定螺丝(34),  
取出屏蔽盒。  
拆下三条全平电缆和  
两个接线器(35), 然  
后松去主电路印刷电

路板后面的四支卡销  
(36)。  
将机芯底盘/磁带盒  
室机构控制器提起,  
取出主电路印刷电  
路板, 然后松去两支固  
定螺丝(37)。  
: 松去两支固定螺丝(38)。

磁带盒室机构  
控制器



下视图

## 2-2 盒室控制机构组装的注意事项

### 盒室控制机构的组装

安置盒室控制器电路于盒室机构之前，先对其自身进行初期设定。初期设定的进行分电路设定和机械设定。

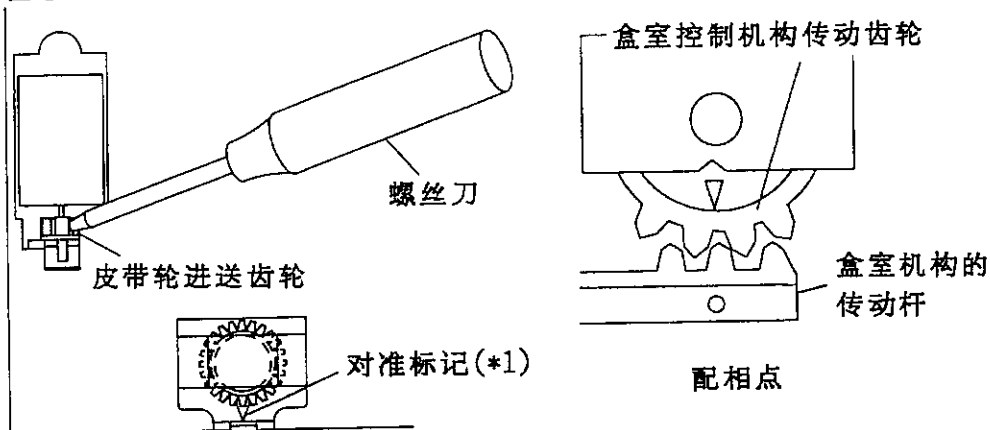
#### 电路设定：

- (1) 短接工作电路印刷电路板上的TP插头(TP500\*)的TP5005与TP5006之间。
- (2) 插AC引线插头于AC电源插座，以确认盒室机构退回至其初始位置(\*1)。
- (3) 拔出AC引线插头，拆去TP5005与TP5006之间的短路。

注意：此方法用于盒室机构已设定好其印刷电路板之场合。

#### 机械设定：

用螺丝刀拨转磁带装挂马达皮带轮进送齿轮，让盒室机构退回至其初始位置(\*1)。确认其动作到位后，再安置盒室控制器电路于其机构之上。（此方法用于盒室机构未设装印刷电路板之场合。）



### 盒室机构与印刷电路板的连接

将盒室机构上的两个凸块对准主电路印刷电路板上的两个定位参考记号（圆形为正参考，椭圆形为副参考）。然后垂直放下盒室机构，注意切勿让其机构的边缘部碰伤附近的其它元件。旋紧固定盒室机构和主电路印刷电路的两支螺丝（一支用于固定盒室机构和前置放大器屏蔽，另一支位于主电路印刷电路板焊线侧的磁带装挂马达近旁）。插接盒室机构和主电路印刷电路板间的扁平型电缆插接器（AG、AD和AH）以及导线插接器（AE和AL）。

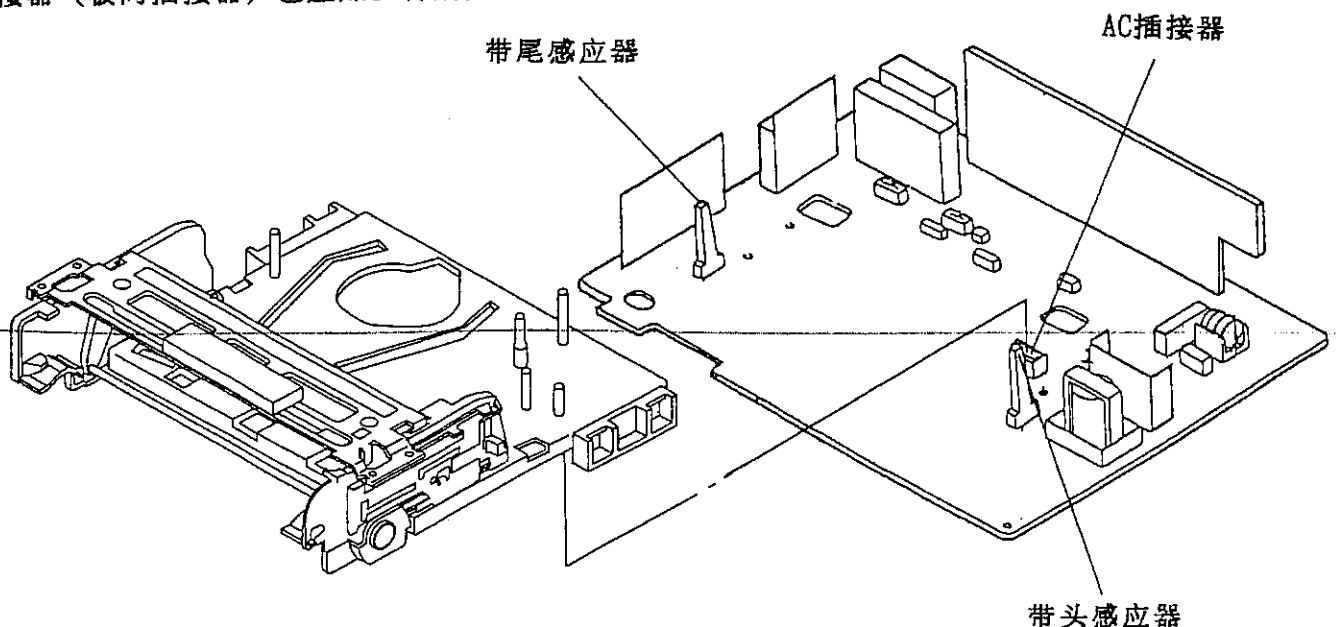
#### 应特别注意的元件：

带头感应器、带尾感应器：D710、D709

录象功能触点开关：S701

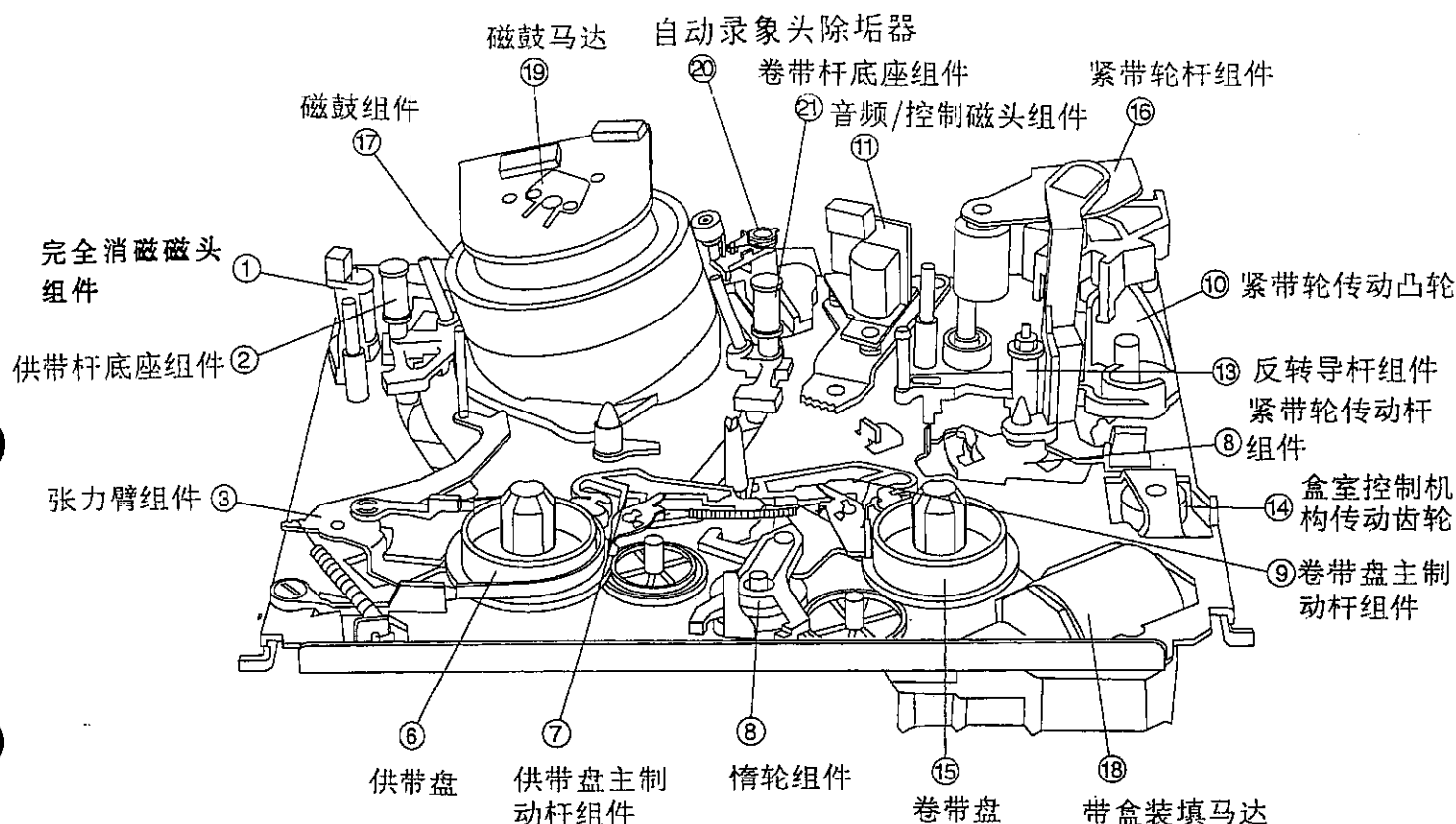
盒室机构与主电路印刷电路板间的MC-AC

插接器（板间插接器）也应加以特别注意。



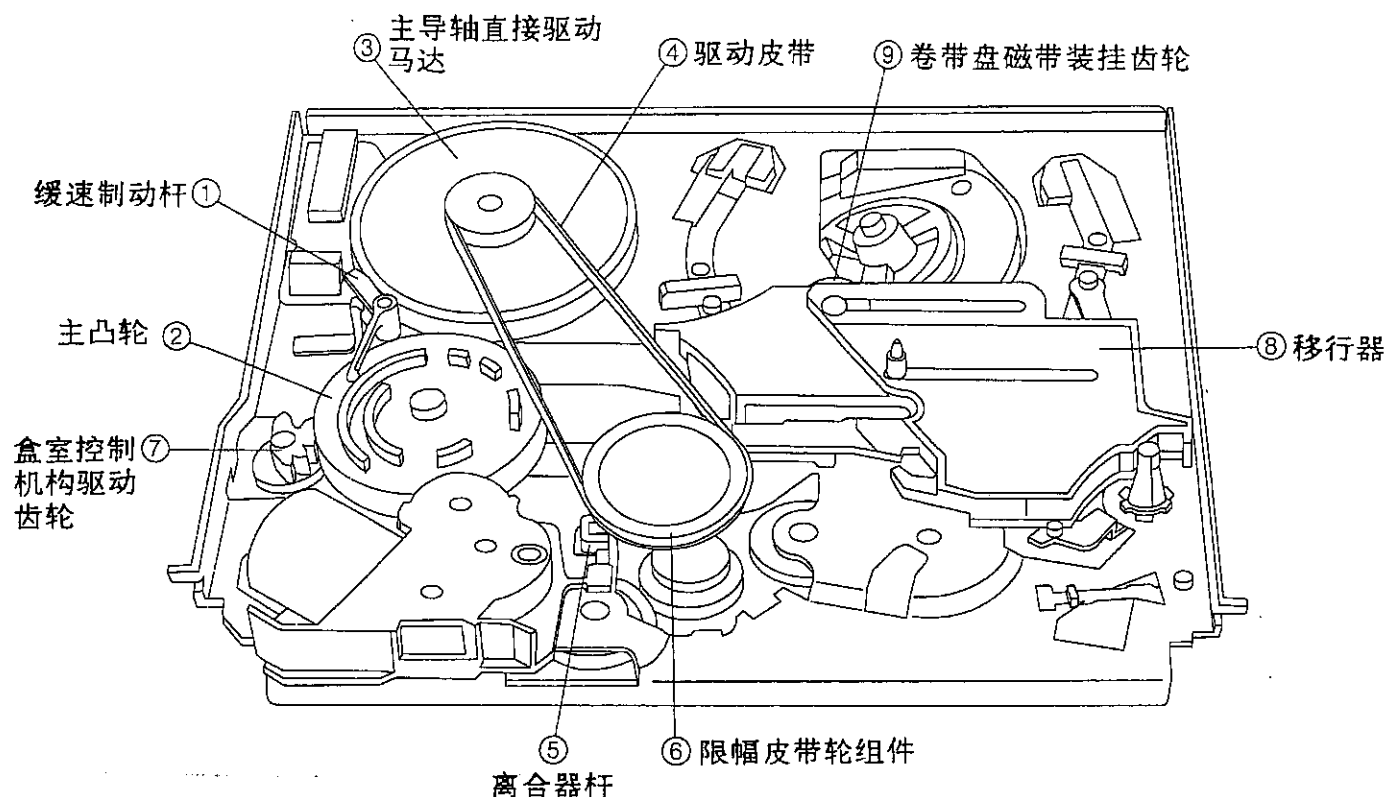


## 3. 主要机械部件的配置（俯视）及其功能



序号	功 能	序号	功 能
3.	张力臂组件 检测走带时录象磁带的松紧程度，并通过张力带对供带盘产生制动作用。	13.	反转导杆组件 拉挂磁带，并且通过其高导杆和低导杆控制其走带高度。
7.	供带盘主制动杆组件 于录象机动作停止时以及录象机处快进或倒带状态时，对供带盘产生制动作用，以防止磁带的松弛。	16.	紧带轮杆组件 于走带状态中，压装磁带于主导轴。
9.	卷带盘主制动杆组件 于录象机动作停止时以及录象机处快进或倒带状态时，对卷带盘产生制动作用，以防止磁带的松弛。	18.	带盒装填马达 其马达之作用在于为装填状态机构提供带盒填入及磁带装挂的动力。其动力通过马达皮带的传动，转为主凸轮及磁带盒室控制机构的动作。

# 主要机械部件的配置（仰视）及其功能



序号	功 能	序号	功 能
1.	缓速制动器 于缓速静止状态时，其制动器相触于与主凸轮连动的主导轴，对其轴产生适当的制动作用。	6.	限幅皮带轮组件 将主导轴直接驱动马达的动力经带盘惰轮传递给带盘。
3.	主导轴直接驱动马达 提供走带所需动力。其动力的转换由带盘皮带实现。	8.	移行器 将主凸轮的运动传输至制动器组件、磁带装挂齿轮、张力臂及离合器杆。
4.	驱动皮带 带动限幅皮带轮转动，以驱动磁带的运转。	9.	卷带盘磁带装挂齿轮 通过磁带装挂继动齿轮，移动卷带杆底座及导辊，并将磁带环绕于磁鼓。另外，其齿轮还有传动力于供带盘磁带装挂齿轮之作用。

## 4. 机械部件的调整、更换及装配

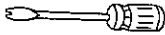

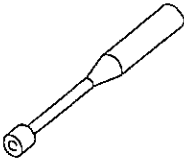

这里我们将为您介绍一些较简单的保养调试方法。这些方法与需要特殊的仪器和工具的复杂检修（例如，磁鼓的组装或更换等）相比更为容易简单。

我们相信，下表所列便于使用的工具在您为本录象机定期保养以维持其原有的工作状态中无疑能起很大的作用。

## 机械部件调整必需的工具

检查修理时，应准备下列工具才能顺利进行修理工作。

序号	工具名称	零件编号	编码	形状	备注
1	带盘高度调整工具	JIGRH0002	BR		用于检查、调整带盘高度。
2	主平面调整工具	JIGMP0001	BY		
3	音频/控制磁头倾斜调整工具	9DAACH-A323U	BX		用于设定音频 / 控制磁头的倾斜角度。
4	转矩测量计(90克)	JIGTG0090	CM		用于检查、调整供带轮和卷带轮的转动转矩。
	转矩测量计(1.2公斤)	JIGTG1200	CN		
5	转矩测量计测头	JIGTH0006	AW		
6	盒匣磁带式转矩测量计	JIGVHT-063	CZ		用于检查、调整卷带轮的转动转矩以及测量磁带反向张力。
7	张力测量计(300克)	JIGSG0300	BF		分为300克和2.0公斤两量级，用于张力测量。
	张力测量计(2.0公斤)	JIGSG2000	BS		
8	六角扳手(0.9毫米)	JIGHW0009	AE		用于松弛或紧固特制六角螺栓。
	六角扳手(1.2毫米)	JIGHW0012	AE		
	六角扳手(1.5毫米)	JIGHW0015	AE		
9	校正用磁带 (NTSC)	VROATSV	CD		专用于机器的电路微调。
	校正用磁带 (PAL)	VROCPSV	CK		
	校正用磁带	VROCBFFS	CB		
	校正用磁带	VROCPZJS	CA		
11	张力测量计接续器	JIGADP003	BK		用于张力测量计。

序号	工 具 名 称	零件编号	编号	形 状	备 注
12	专用螺丝刀	JIGDRIVERH-4	AP		用于导辊高度调整。
14	扭转改锥 (5 公斤)	JIGTD1200	CB		用于扭转树脂制工具。标准扭转值为 5 公斤。
15	套管改锥	JIGDRIVER110-7	AS		用于音频/控制磁头高度和 X 位置的调整。
		JIGDRIVER110-4	AV		用于更换供带阻抗滚子。
		JIGDRIVER110-55	AR		用于更换反转导杆。
16	反转导杆高度调整工具	JIGRVGH-F18	BU		用于反转导杆的高度调整。

## 机械部件的定期保养期间

为保持机械部件的正常工作性能，务必按下表定期进行维护保养。

部件名称	保养间隔	每500小时	每1000小时	每1500小时	每2000小时	可能出现症状	备 注
导辊组件		□	□	□	○	水平噪音线出现，磁头不时被磁带缠绞。	如发生不正常的旋转或显著的摇摆，就需更换该部件。
供带阻抗滚子		□	□	□	○		
供带阻抗滚子(内侧)			□		□		
供带阻抗滚法兰		□	□	□	□		用指定清洁剂擦拭与磁带接触部份。
定位导杆		□	□	□	□		
斜杆		□	□	□	○		
上部磁鼓组件和下部磁鼓组件		□	○□	○□	○□	信号/噪声比过小,无彩色表现。装入校正用磁带时,包络线非平坦。	用指定清洁剂擦拭与磁带接触部份。
完全消磁磁头		□	□	□	○	色彩过淡, 图象闪烁。	
音频/控制磁头		□	□	□	○	声音太小或者噪音太大。	
主导轴直接驱动马达		□	□	□	○	磁带不转, 色彩不均。	
紧带轮		□	□	□	○	不走带, 磁带松弛。	用指定清洁剂擦拭橡胶与橡胶接触部份。
带盘皮带			□		○	不走带, 磁带松弛, 快进或倒带时走带不正常。	
张力带组件					○	带盒不填入或不退出。	
装填马达					○		
带盘惰轮组件					○	不走带。	
带盘皮带轮组件			□△		□○		
离合器齿轮组件					○		
供带/卷带主制动杆					○	磁带松弛。	
AHC (自动录象头除垢器)			○		○		除垢器滚轮部位的磨损过大时, 就需更换该部件。更换时, 只要更换录象头除垢器臂组件即可。

注意：○：部件更换

□：部件清洗（用不起毛的网布蘸异丙醇擦拭）

△：部件注油（注有标记之部件应该每1000小时用高级轴油点注润滑）

如发现所测数值超过或不及规定范围，务必对该部件进行清洗或加以更换

## 磁带盒室控制机构的拆卸及安装

### ●盒室控制机构的拆卸

1. 退出磁带盒匣，设机构于出盒状态。
2. 从电源插座中拔出电源引线插头。
3. 按下述步骤的要求顺序进行拆卸。
  - a) 松去紧固磁带盒室控制机构的紧固螺丝①。
  - b) 按箭头方向移动磁带盒室控制机构，然后将其向上拉出。

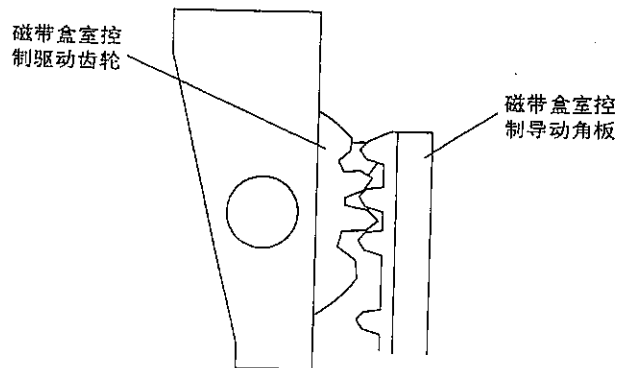


图4-2

2. 按拆卸步骤的相反顺序进行组装。

注意：

- ① 拆卸或组装时，如使用带磁螺丝刀，务请注意不要让其触碰音频/控制(A/C)磁头、完全消磁(FE)磁头以及磁鼓。
- ② 拆卸或组装磁带盒室控制机构时，务请谨慎小心，切勿磕碰其机构，同时注意不要让工具等碰撞导向销、磁鼓等精密度较高的部件。
- ③ 组装之后，填装一录象带盒于盒室控制机构中。

## 无盒室控制机构的走带测试

1. 电源接通之前，短接工作电路印刷电路板上的TP5005与TP5006之间。
2. 插电源引线插头于电源插座。
3. 开启电源开关。
4. 用手打开磁带盒匣端口之盖。
5. 用胶带张贴之以保持其开盖状态。
6. 置其于机芯底盘中的走带机构。
7. 应将500克的重物牢固地安置于录象带盒上。
8. 作磁带的走带测试。

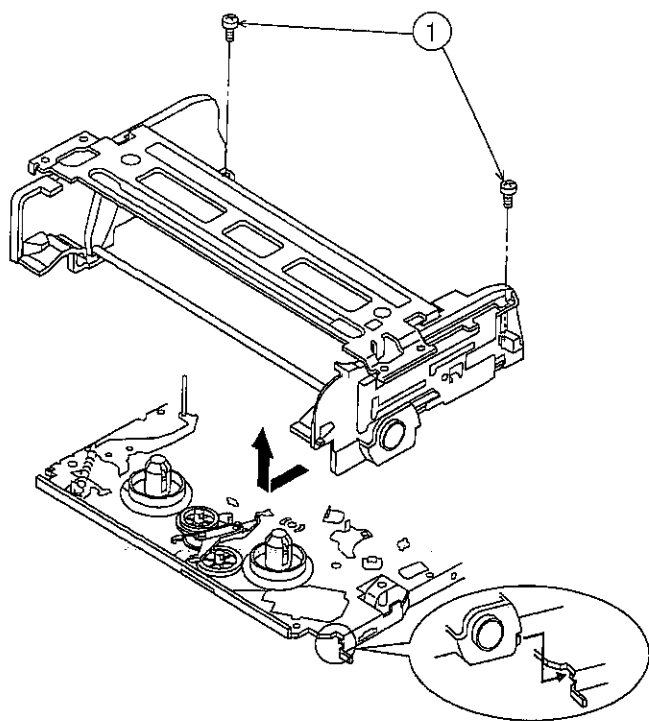


图4-1

### ●盒室控制机构的组装

1. 安装盒室控制机构前，短接工作电路印刷电路板上的TP5005与TP5006之间，然后，插入电源引线插头，盒室控制机构驱动齿轮开始转动。机芯底盘窗口处正好看见大齿转时转动停止。按图4-2所示，盒室控制机构驱动齿轮的第二齿条与盒室控制机构驱动角板的第三齿条啮合，以便调整机芯底盘上的盒室控制机构位置。

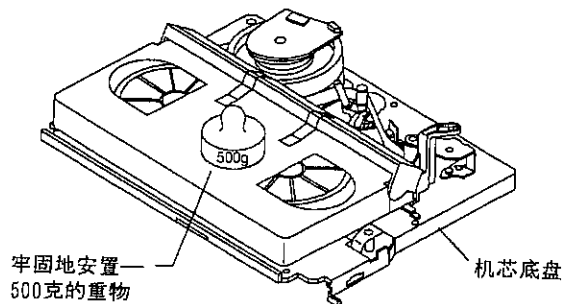


图4-3

注：压其重物不得超过500克。

## 带盘座的更换及其高度的检测和调整

### ●带盘座的拆卸

1. 拆去磁带盒室控制机构。
2. 从张力臂上取出张力带。
3. 用手松开供带/卷带用辅助制动器，拆去供带用主制动器和卷带用主制动器。
4. 松开带盘座上的卡销，拆去供带盘座和卷带盘座。

<出盒或U停止状态时>

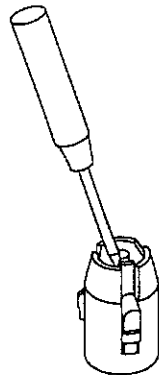
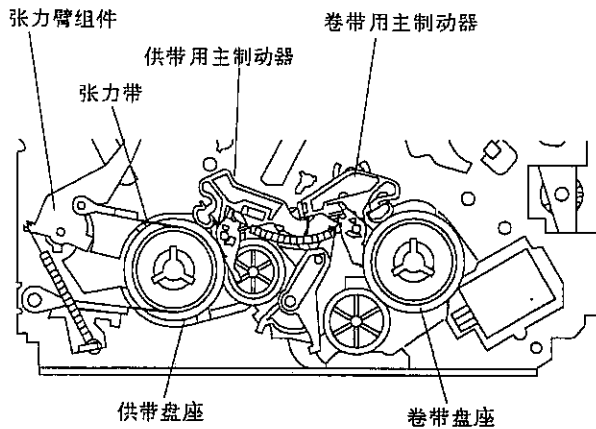


图4-4

注意：

拆卸时，应按图中箭头所示方向按压张力带，以免使锁扣变形。

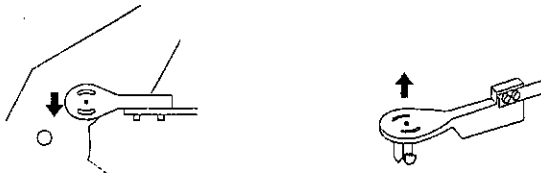


图4-5

### ●供带盘座的更换

1. 清擦供带盘座轴，并注油加以润滑。
2. 将带盘座的接合部与带盘继动齿轮啮合，然后将准备好的新供带盘座插套入其轴。

3. 环张力带与供带盘座装置安置就位，并在松开供带用辅助制动器之状态下，将其端插入张力臂之插孔。

4. 检查供带盘座的高度。

注意：

- ① 安置供带盘座时，务请格外小心，切勿弯折扭曲张力带。
- ② 切勿碰伤供带用主制动器与带盘继动齿轮。

### ●卷带盘座的更换

1. 清擦卷带盘座轴，并注油加以润滑。
2. 松开卷带用辅助制动器，接着将带盘座的接合部与带盘继动齿轮啮合，然后将准备好的新卷带盘座插套入其轴。
3. 检查卷带盘座的高度后，安置卷带用主制动器就位。

注意：

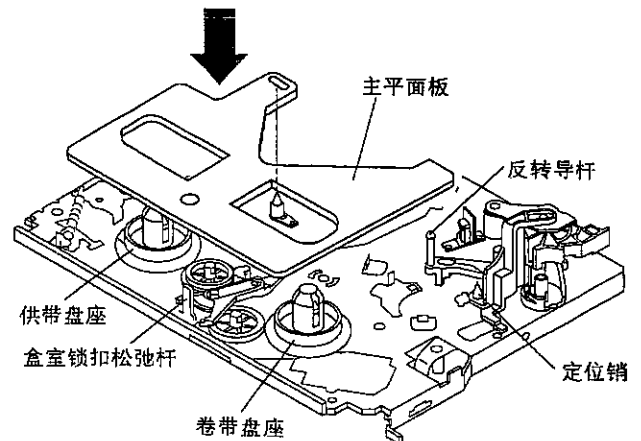
务请小心谨慎，切勿碰伤卷带用主制动器。

\* 带盘座更换之后，须检查调试视频搜索倒带时的反向张力（见第82页），以及其制动力矩（见第84页）。

### ●带盘高度的检测和调整

注意：

将主面板设置于机芯底盘，注意切勿磕碰磁鼓（见图4-6所示）。



用手指松开反转导杆，使主面板设置。

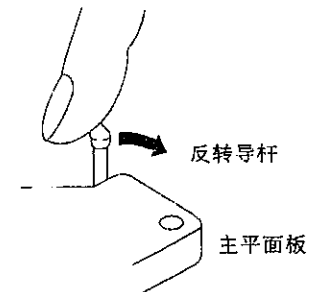


图4-6

- 检查带盘座是否低于图示A位置而高于B位置。如果所测高度不在AB两位置的要求范围内,则通过更换带盘座下面的滑动垫圈对其高度进行调整。

注意:

带盘座只要一经更换,就必须对其进行高度的检测和调整。

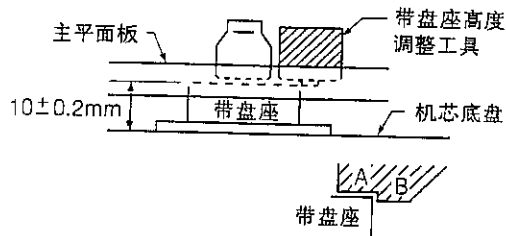


图4-7

## 快进状态时卷带转矩的检测和调整

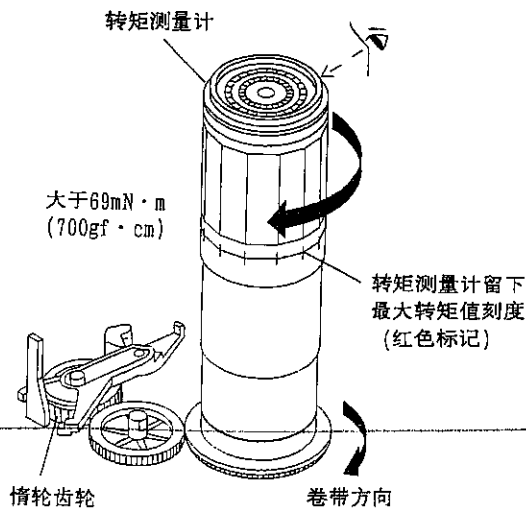
- 拆去磁带盒室控制机构。
- 电源接通之前,短接工作电路印刷电路板上的TP5005与TP5006之间。

### ●转矩测量计的设置

- 1.设转矩测量计的刻度于0,然后将其转矩测量计安置于卷带盘座上。
- 2.触按倒带(REW)键,置盒室控制机构于倒带状态。
- 3.缓慢地旋转卷带盘座,置移行器于倒带状态。

### ●倒带状态时的转矩检测

- 1.用手缓慢地沿卷带方向旋转转矩测量计(2~3秒/转)。
- 2.检查所测卷带转矩值是否大于 $69\text{mN} \cdot \text{m}$  ( $700\text{gf} \cdot \text{cm}$ )。



### ●快进状态时的转矩调整

- 1.如果所测卷带转矩超出或不及规定值范围,则需用清洗液清擦主导轴直接驱动马达皮带轮、带盘皮带及其皮带轮。然后,再测量之。

- 2.如果清擦后所测卷带转矩仍不符合规定要求,则需更换传动皮带。

注意:

- 1.设置及计测时,须用手向下按住转矩测量计,以免卷带盘的旋转甩飞安置于其上的转矩测量计。
- 2.作卷带转矩检测时,不宜让带盘座锁扣时间过长。

## 倒带状态时卷带转矩的检测和调整

- 拆去磁带盒室控制机构。

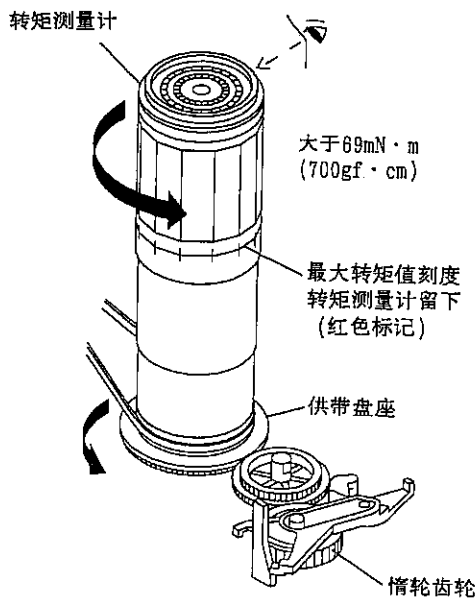
- 电源接通之前,短接工作电路印刷电路板上的TP5005与TP5006之间。

### ●转矩测量计的设置

- 1.设转矩测量计的刻度于0,然后将其转矩测量计安置于卷带盘座上。
- 2.触按倒带(REW)键,置盒室控制机构于倒带状态。
- 3.缓慢地旋转卷带盘座,置移行器于倒带状态。

### ●倒带状态时的转矩检测

- 1.用手缓慢地沿卷带方向旋转转矩测量计(2~3秒/转)。
- 2.检查所测卷带转矩值是否大于 $69\text{mN} \cdot \text{m}$  ( $700\text{gf} \cdot \text{cm}$ )。



### ●倒带状态时的转矩调整

- 1.如果所测卷带转矩超出或不及规定值范围,则需用清洗液清擦主导轴直接驱动马达皮带轮、传动皮带及限幅皮带轮。然后,再测量之。



2. 如果清擦后所测卷带转矩仍不符合规定要求, 则需更换传动皮带。

注意:

1. 设置及计测时, 须用手向下按住转矩测量计, 以免卷带盘的旋转甩飞安置于其上的转矩测量计。
2. 作卷带转矩检测时, 不宜让带盘座锁扣时间过长。

### 再现状态时卷带转矩的检测和调整

1. 拆去磁带盒室控制机构。
2. 电源接通之前, 短接工作电路印刷电路板上的 TP5005 与 TP5006 之间。
3. 用手揭开盒匣磁带式转矩测量计端口盒盖, 用两张胶带张贴之以保持其开盖状态。
4. 装填盒匣磁带式转矩测量计于录象机中。

规定值为 LP  $10.5 \pm 3.8 \text{ mN} \cdot \text{m}$  ( $107 \pm 39 \text{ gf} \cdot \text{cm}$ )

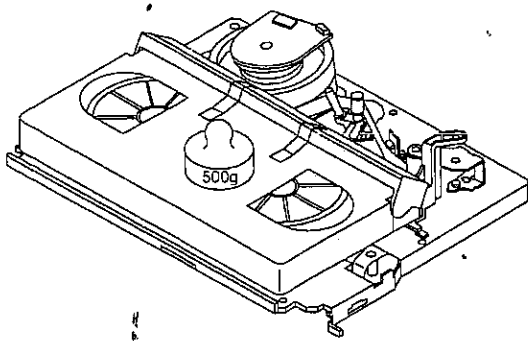


图4-10

5. 加一500克的重物于盒匣磁带式转矩测量计上。
6. 触按录象 (REC) 键, 设录象机于录象状态。

#### ●再现状态时卷带转矩的检测

1. 检查所测转矩值是否于  $10.5 \pm 3.8 \text{ mN} \cdot \text{m}$  ( $107 \pm 39 \text{ gf} \cdot \text{cm}$ )。
2. 由于带盘旋转的不均匀性, 所测转矩值有可能产生波动现象。这时应取波动值的中心值为其测定值。
3. 触按录象 (REC) 键, 置录象机为 LP 录象状态, 检查这时的卷带转矩是否满足上述要求。

#### ●再现状态时卷带转矩的调整

如果所测卷带转矩超出或不及其规定值范围, 则需更换限幅皮带轮组件。

注: 压一重物于测量计之上, 以防其翘起。

### 视频搜索倒带状态时卷带转矩的检测和调整

- 拆去磁带盒室控制机构。
- 电源接通之前, 短接工作电路印刷电路板上的 TP5005 与 TP5006 之间。

#### ●设置

1. 触按再现 (PLAY) 键, 设录象机于再现状态。
2. 触按倒带 (REW) 键, 设录象机于视频搜索倒带状态。

#### ●视频搜索倒带状态时的转矩检测

1. 置转矩测量计于供带盘座之上, 逆时针方向缓慢地旋转之 (1~2秒/转), 检查所测转矩值是否于  $14.0 \pm 3.9 \text{ mN} \cdot \text{m}$  ( $144 \pm 40 \text{ gf} \cdot \text{cm}$ ) 的规定范围内。

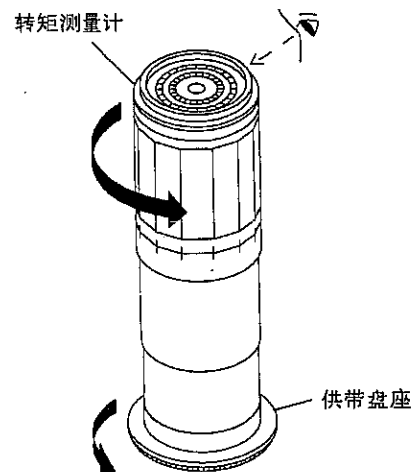


图4-11

#### ●视频搜索倒带状态时的转矩调整

如果所测视频搜索倒带状态时的卷带转矩超出或不及其规定值范围, 则需更换限幅皮带轮组件。

注意:

应将转矩测量计牢固地安置于供带盘座之上, 否则, 所测值并非真实。

注意:

由于限幅皮带轮旋转的不均匀性, 所测转矩值有可能产生波动现象。这时应取波动值的中心值为其测定值。

## 视频搜索倒带状态时的 反向张力的检测

- 拆去磁带盒室控制机构
- 电源接通之前，短接工作电路印刷电路板上的TP5005与TP5006之间。

### ●检测反向张力

1. 触按再现(PLAY)键，设录象机于再现状态。
2. 触按倒带(REW)键，设录象机于视频搜索倒带状态。
3. 置转矩测量计于卷带盘座之上，逆时针方向缓慢地旋转之(2~3秒/转)，检查所测转矩值是否于 $2.7 \pm 1 \text{ mN} \cdot \text{m}$  ( $28 \pm 10 \text{ gf} \cdot \text{cm}$ ) 的规定范围内。

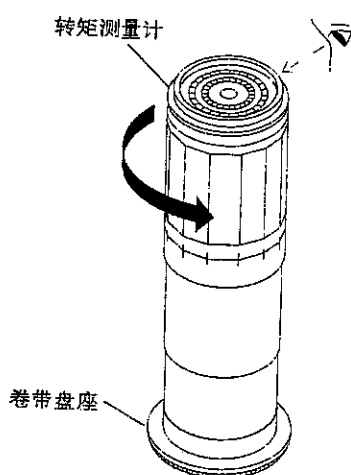


图4-12

注意：

1. 应将转矩测量计牢固地安置于卷带盘座之上，否则，所测值并非真实。
2. 在加负荷于带盘座之状态下，转矩测量计所示的数值是真实的转矩测量值。

## 紧带轮压力的检测

- 拆去磁带盒室控制机构。
- 电源接通之前，短接工作电路印刷电路板上的TP5005与TP5006之间。

### ●检测

触按再现(PLAY)键，设录象机于再现状态。

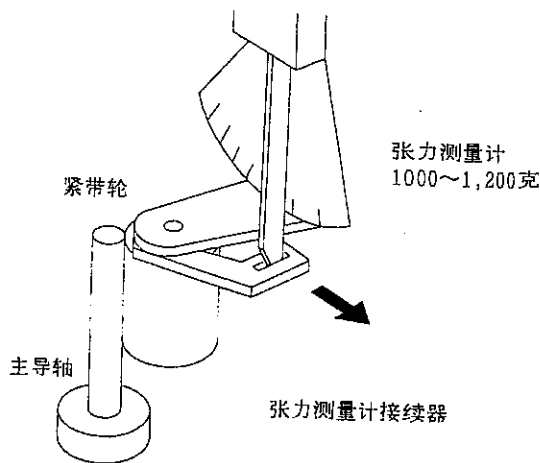


图4-13

1. 拨移紧带轮，使之与主导轴分离。
2. 通过套挂张力测量计连接器将张力测量计设置于紧带轮轴之上。
3. 慢慢放松压力，让紧带轮渐渐靠拢主导轴。在紧带轮与主导轴相触的瞬间，测量计上的读数就是所要计测的压力值。
4. 检查所测压力值是否在900~1,200克的规定范围内。

## 张力杆位置的检测和 调整

- 拆去磁带盒室控制机构。
- 电源接通之前，短接工作电路印刷电路板上的TP5005与TP5006之间。

### ●设置

1. 揭开录象带(E-180)盒盖，用两片胶带将开盖固定。
2. 装入开盖的录象带带盒于盒室机构。
3. 在录象带带盒上加500克的重物。
4. 用E-180录象带的带头部份进行检测。

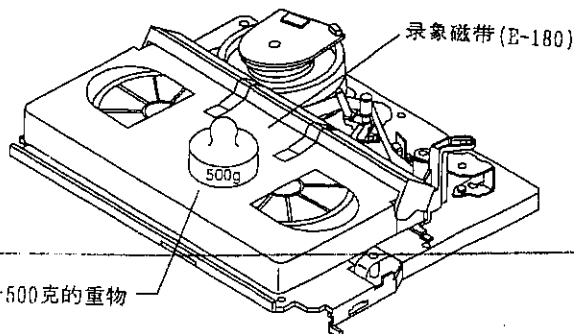


图4-14

### ●调整

1. 安置好录象带带盒，触按录象(REC)键，让挂带机构挂好磁带后，检查张力杆的位置。

2. 通过观察检查张力杆中心是否位于与供带侧导轴左侧离开1.3mm之位置。其重调方法如下。

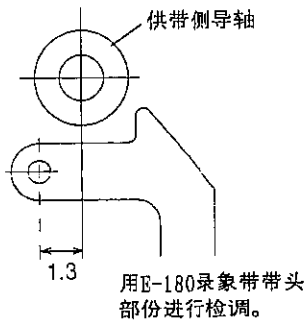


图4-15

① 张力杆左端偏移至虚线的左侧时：

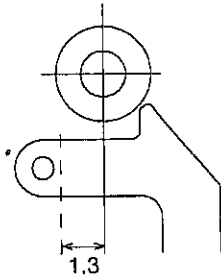


图4-16

插一字口螺丝刀于张力杆调整器，顺时针旋转之。

② 张力杆左端偏移至虚线的右侧时：

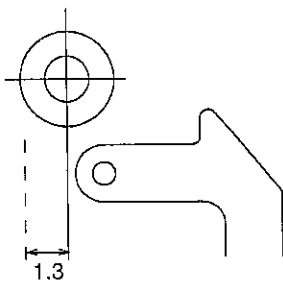


图4-17

插一字口螺丝刀于张力杆调整器，逆时针旋转之。

③ 张力杆调整器的调整范围

④ 张力杆调整凸轮的调整范围

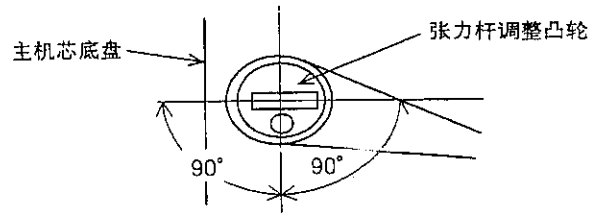


图4-18

调整张力杆调整器，使凸轮上的圆型标志处于左右90°范围内。

### 录象/再现状态时反向张力的检测和调整

- 拆去磁带盒室控制机构。
- 电源接通之前，短接工作电路印刷电路板上的TP5005与TP5006之间。
- 设置
  1. 揭开录象带转矩计盒盖，用两片胶带将开盖固定。
  2. 装入开盖的录象带转矩计于盒室机构。
  3. 在转矩计盒盖上加500克重物。

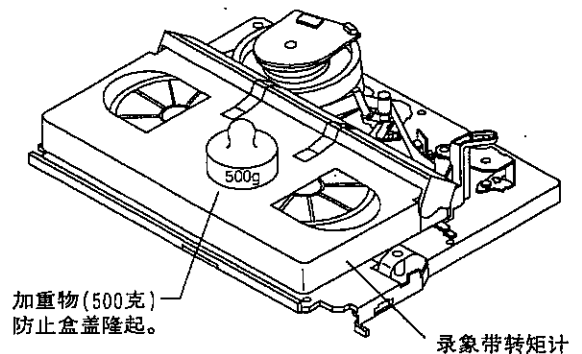


图4-19

### ● 反向张力的检测

1. 触按录象(REC)键，设录象机于录象状态。
2. 检查所测反向张力值是否在 $31 \sim 38 \text{ g} \cdot \text{cm}$ 的规范范围内。

注意：

1. 确认走带时，不发生磁带高出定位导杆的现象。
2. 确认磁带自始至终不发生松弛或损伤现象。

●反向张力的调整

1. 录象带转矩计所测读数小于规定值时, 向A方向移动张力弹簧。
2. 录象带转矩计所测读数大于规定值时, 向B方向移动张力弹簧。

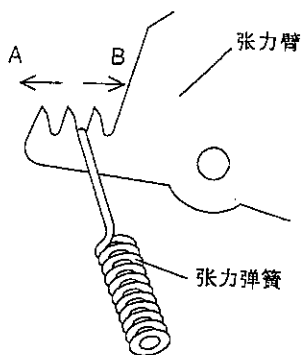
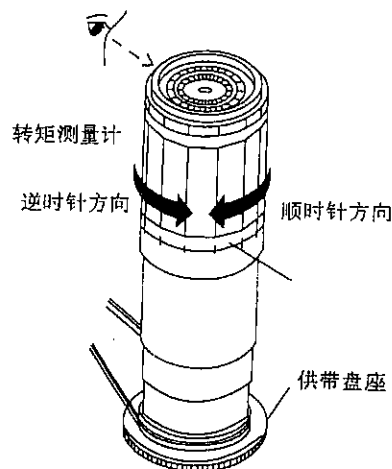


图4-20

制动力矩的检测

●供带侧制动力矩的检测



逆时针方向: 5.9~9.8mN.m(60~100gf.cm)  
顺时针方向: 10~32mN.m(100~330gf.cm)

图4-21

- 拆去磁带盒室控制机构。
- 电源接通之前, 短接工作电路印刷电路板上的TP5005与TP5006之间。

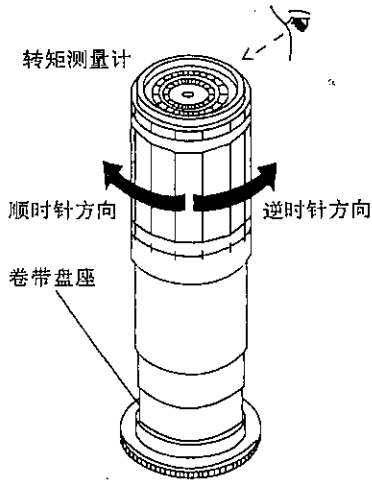
●设定方法

1. 设转矩测量计的刻度于0, 置其于供带盘座之上。
2. 转换快进(FP)状态为停止(STOP)状态。
3. 拔出交流电源插头。

●检测方法

1. 用手沿供带制动的顺时针方向和逆时针方向旋转转矩测量计 (约每2秒旋转一次), 使转矩测量计的刻度盘与供带盘以同样的转速旋转。然后, 检查所测值是否满足其规定要求:  
顺时针方向制动力矩=10~32mN.m(100~330gf.cm); 逆时针方向制动力矩=5.9~9.8mN.m(60~100gf.cm)。另外, 两者所测值还得满足顺时针方向制动力矩至少等于逆时针方向制动力矩的两倍之规定要求。

### ●卷带侧制动力矩的检测



逆时针方向：9.8~34mN.m(100~340gf.cm)  
顺时针方向：4~8.3mN.m(40~85gf.cm)

图4-22

- 拆去磁带盒室控制机构。
- 电源接通之前，短接工作电路印刷电路板上的TP5005与TP5006之间。

### ●设定方法

1. 设转矩测量计的刻度于0，置其于卷带盘座之上。
2. 转换快进(FF)状态为停止(STOP)状态。
3. 拔出交流电源插头。

### ●检测方法

1. 用手沿卷带制动的顺时针方向和逆时针方向旋转转矩测量计(约每2秒旋转一次)，使转矩测量计的刻度盘与卷带盘以同样的转速旋转。然后，检查所测值是否满足其规定要求：  
逆时针方向制动力矩=9.8~34mN.m(100~340gf.cm)；顺时针方向制动力矩=4~8.3mN.m(40~85gf.cm)。另外，两者所测值还得满足逆时针方向制动力矩至少等于顺时针方向制动力矩的两倍之规定要求。

### ●供带侧以及卷带侧制动力矩的调整

1. 如果供带侧或卷带侧制动力矩所测值不符合规定要求，则应清擦供带盘座或卷带盘座制动杆及其垫圈，然后重新检测之。
2. 如果清擦后重测制动力矩还不符合规定要求，则需更换主制动器组件。

### 注意：

主制动器一经更换，则需进行高度的检测与调整(见第79页所述)，以及制动力矩的检测。

## 音频/控制(A/C)磁头的更换

1. 拆去磁带盒室控制机构。
2. 设录像机于磁带卸挂状态后，拔去其电源引线插头。

2

### ●A/C磁头的拆卸

1. 松开螺丝①、②、③、④及⑤。
2. 松焊A/C磁头印刷电路板与A/C磁头的连线。

### 注意：

1. 拆装更换后，必须进行磁带走行检查调整(见第66页所述)。拆装过程中，无论是什么情况，都不得用手或他物触碰A/C磁头。
2. 松去①、②、③螺丝时，注意防止其弹簧弹出遗失。

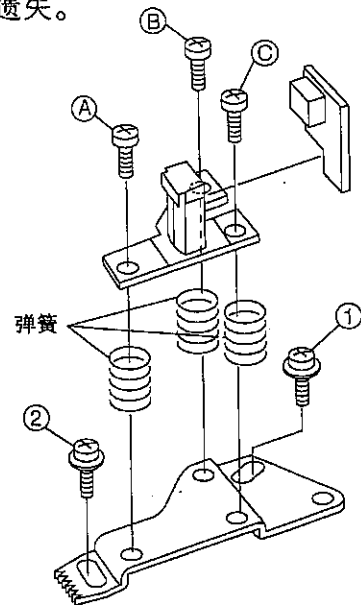


图4-23

### ●A/C磁头的更换

1. 焊接拆下的A/C磁头印刷电路板与更换用新A/C磁头的连线。
2. 用滑动式卡钳，使A/C磁头臂(底面)与A/C磁头基板(螺丝位置)间的高度调至10.3mm(3处)(见下图)

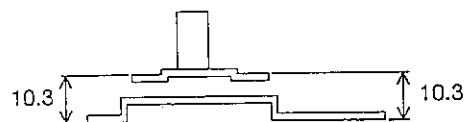
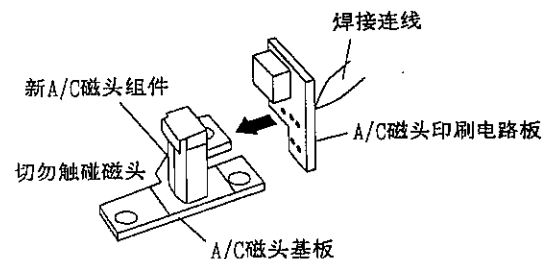


图4-24

- 将A/C磁头臂齿轮左侧的标志与机芯底盘上的标志对齐，暂时旋紧螺丝①和②，直至A/C磁头臂顺利旋转为止。

(注：暂时旋紧时的力矩以0.2N.m为宜)

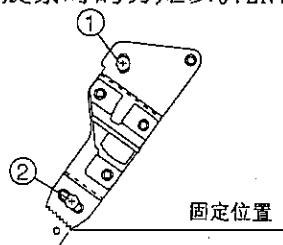


图4-25

注意：

如果螺丝①与②的夹紧力矩不一致，正式旋紧时可能难以调整A/C磁头的高度。

### [A/C磁头的高度粗调]

#### ●设置

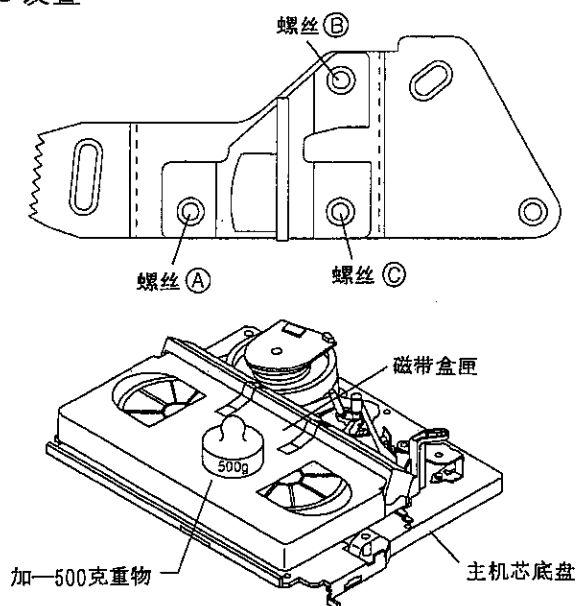


图4-26

- 装入录象带于机芯底盘中。
- 触按再现(PLAY)键，设录象机于再现状态。
- 旋转螺丝③，以对A/C磁头高度进行粗调，使磁带达至下面所示位置为宜。

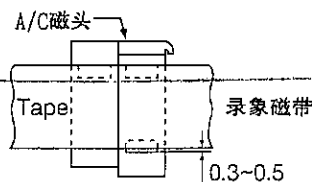


图4-27

#### ●调整

调节螺丝③，使控制磁头底边缘低于磁带底边缘0.3~0.5mm为宜。

## 反转导杆的高度调整

### [反转导杆的高度调整]

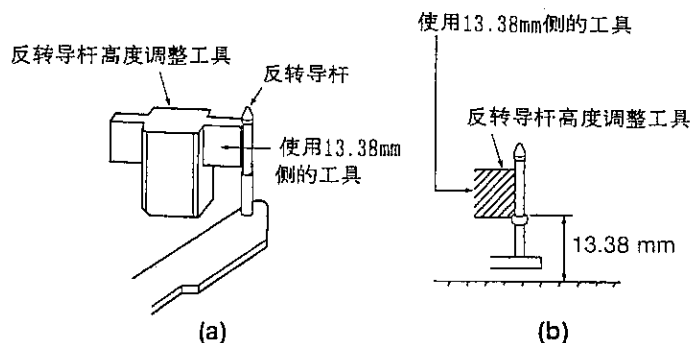
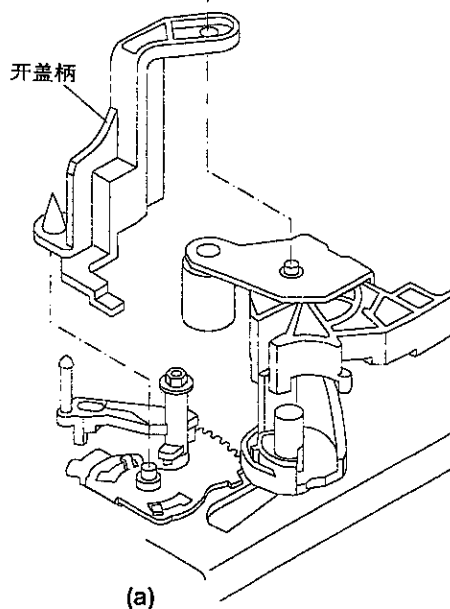
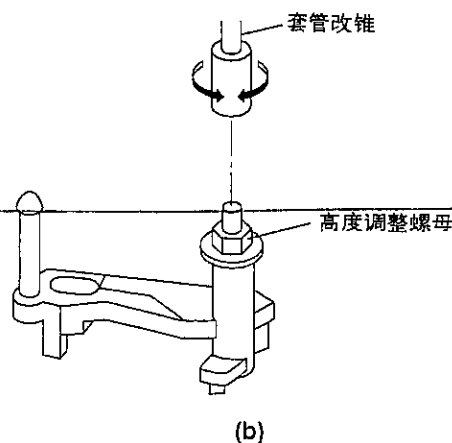


图4-28

- 拆下开盖柄。(图4-29(a))
- 先于录象带装挂状态下调整13.38mm端，然后再沿逆时针方向旋转反转导杆的高度调整螺母至36°。
- 录象带装挂动作结束后，设录象机于再现状态，检查靠近反转导杆处的录象带是否皱折。
- 用一般市场上贩卖的套管改锥旋转高度调整螺母。



(a)



(b)

图4-29

## 走带情况的调整

1. 拆去磁带盒室控制机构。
2. 电源接通之前，短接工作电路印刷电路板上的 TP5005 与 TP5006 之间。
3. 检测和调整张力杆的位置。(见第82页)
4. 检测和调整视频搜索状态时的反向张力。(见第82页)
5. 设定A/C磁头于规定位置。(见第85页)
6. 按下述步骤对走带情况进行粗调。
  - a) 连接示波器于再现色彩包络线输出 (TP501) 的测试点。设示波器同步于外接。这样，再现色彩信号便会被磁头转换脉冲 (TP502) 所触发。
  - b) 先松开导辊底部的固定螺丝，然后再用六角扳手 (JIGHW0009) 调节该固定螺丝，直至能轻松圆滑地旋动导辊之程度为止。(切勿把固定螺丝过松紧，否则会造成导辊不稳定状态。)(见图4-30)

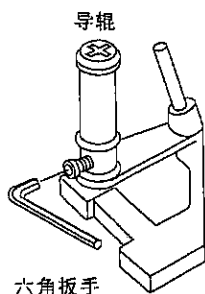


图4-30

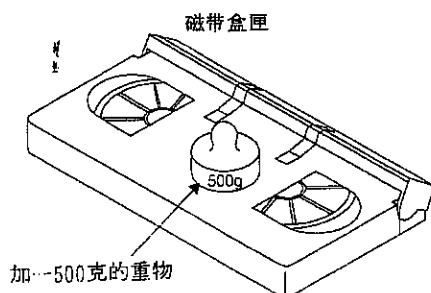


图4-31

- c) 将校正用磁带 (单象管图案) 盒匣安置于带盘座上，然后，将录象机设定于再现状态。  
(施加一500克的重物于带盒之上，以防走带时带盒的翘起)。
- d) 于X位置调整状态 (见电路调整有关章节所述)，触按跟踪键 (+) 和 (-)，调输出包络线波形从最大至最小，以及从最小至最大。同时观察其波形是否达至平坦状态。

- e) 如通过上述调节，其输出包络线波形无法达至平坦状态，则需用导辊调整用螺丝刀，对供带侧和卷带侧的导辊进行粗调，直至输出包络线波形达至平坦。
- f) 旋转螺丝 ④，以防由定位导杆法兰在磁带上起皱。  
将磁带转回至原始位置后，检查在定位导杆法兰部位有无发生起皱现象。

### (1) 无起皱时

顺时针方向旋转螺丝 ④，以在法兰部位产生起皱现象，然后松开螺丝 ④，直至完全消除起皱现象为止。

### (2) 起皱时

逆时针方向旋转螺丝 ④，直至完全消除起皱现象为止。

参考：

顺时针方向旋转螺丝 ④ 时，在下部法兰上会产生起皱现象。



图4-32

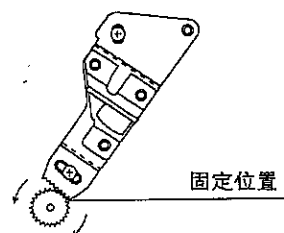


图4-33

### 注意：

1. 将跟踪调节控制钮设定于其中间位置，然后调整X位置，使再现色彩包络线波形达至最大，以便进行走带情况的粗调。
2. 粗调过程中，应特别注意触电等之危险。

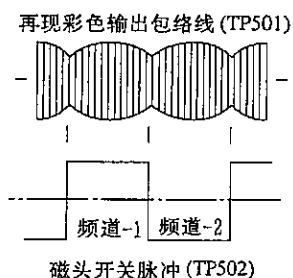


图4-34

### 7. A/C磁头高度和方位角的调整

- 连接示波器于音频输出端。
- 装入预先录有1kHz线性音频信号的校正用磁带,调节螺丝⑤和⑥,使音频输出达至最大。然后,调节螺丝④,以消除定位导杆法兰上产生的起皱现象。(见第87页-6-f)。按螺丝⑤、⑥及④之顺序重复进行该调整,使音频输出达至最大。
- 装入预先录有6kHz线性音频信号的校正用磁带,最后,调节螺丝⑤,使音频输出达至最大。

### 8. 走带系统以及X位置的调整

- 连接示波器于测试点 TP501,作再现彩色包络线输出。设示波器同步于外接。这样,再现彩色信号将被磁头开关脉冲 (TP502) 所触发。

b)再现走带检查用校正磁带。

c)触按跟踪键的(+)或(-),使输出包络线波形从最大转至最小,然后又从最小转为最大。用高度调整用螺丝刀调整供带盘侧和卷带盘侧导辊的高度,使输出包络线尽可能达至平坦。

d)如果走行中的磁带低于或高于螺旋扫描导前,再现彩色输出便会呈现图4-35所示波形。

e)按第87页步骤6的项目e)要求,调节输出包络线的最大平坦度。

f)触按跟踪键的(+)或(-),检查包络线波形的平坦度反应。

g)于磁带卸挂状态,用导辊设定螺丝紧固导辊。

h)再现走带检查用校正磁带,检查输出包络线波形是否发生变化。

### 9. A/C磁头X位置的调整

- 在X位置的调整状态下(见各电路的调试之项),短接工作电路印刷电路板上的TP5005与TP5006之间,使跟踪控制处于中央位置。
- 用调整螺丝刀移动A/C磁头臂,然后调节A/C磁头位置,使磁头开关脉冲高侧的包络线达至最大。最后,旋转螺丝①和②。(此时,应按螺丝①和②之顺序进行)。(见图4-36①和②)。(参考:最后的旋紧力矩以0.6N.m为宜)。
- 调节再现转换点。

	磁带高于螺旋扫描导前		磁带低于螺旋扫描导前	
	供带侧	卷带侧	供带侧	卷带侧
调整	顺时针方向旋转供带盘侧导辊(导辊降低),使其输出波形包络线达至平坦。	顺时针方向旋转卷带盘侧导辊(导辊降低),使其输出波形包络线达至平坦。	逆时针方向旋转供带盘侧导辊(导辊升高),让磁带高过螺旋扫描导前。然后,顺时针方向旋转供带盘侧导辊,使其输出波形包络线达至平坦。	逆时针方向旋转卷带盘侧导辊(导辊升高),让磁带高过螺旋扫描导前。然后,顺时针方向旋转卷带盘侧导辊,使其输出波形包络线达至平坦。

图4-35



- d)再现已录有内容的磁带，以检查包络线波形和音频信号波形的状态。

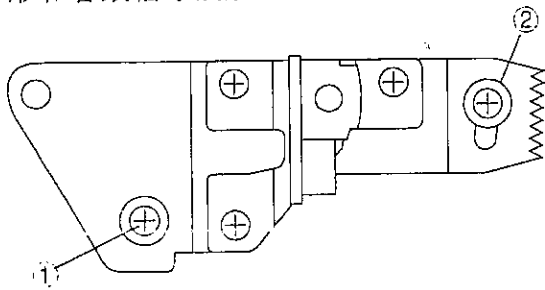


图4-36

## 主导轴直接驱动马达的拆卸和组装

### ● 拆去磁带盒室控制机构。

### ● 直接驱动马达的拆卸（按图中所示顺号进行）

1. 拨开主印刷电路板上的板间插接器的连接。
2. 拆去带盘皮带①。
3. 松去螺丝②。

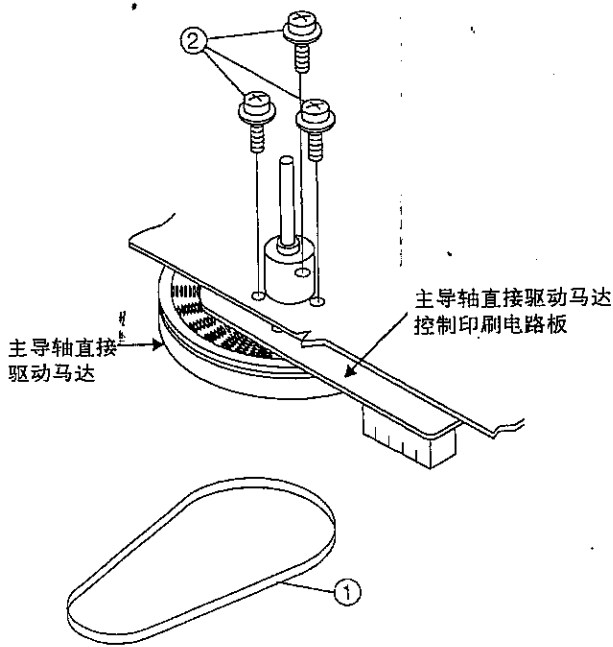


图4-37

### ● 直接驱动马达的组装

1. 将主导轴直接驱动马达就位于机芯底盘。这时，应注意不要让主导轴磕碰机芯底盘。然后，用三支螺丝将其紧固。
2. 套好带盘皮带。连接好主印刷电路板上的板间插接器。

注意：

1. 组装完毕，转动主导轴直接驱动马达，检查其转动是否圆滑。
2. 检测，调整其伺服电路。

## 主导轴直接驱动马达的装拆

1. 设装置于磁带出盒状态。

2. 拔出电源插头。

### ● 直接驱动马达的拆卸（组装时按此相反顺序进行）

1. 拨开FFC电缆线的插接(1)。
2. 松去直接驱动马达定子组件的固定螺丝(2)。
3. 取出直接驱动马达定子组件(3)。
4. 取出直接驱动马达转子组件的固定螺丝(4)。
5. 取出直接驱动马达转子组件(5)。

注意：

1. 拆卸直接驱动马达定子组件时，磁鼓接地弹簧会弹出接地弹簧的压扣环。

注意切勿丢失其接地弹簧。

2. 安装时，必须先将直接驱动马达转子组件的安装孔与下部磁鼓组件的安装孔对齐，然后紧密固定之。

接着再按类似要领安装上部磁鼓。

（将上部磁鼓的槽口与直接驱动马达转子的安装孔对齐。）

3. 操作中，切勿碰伤上部磁鼓和视频磁头。
4. 安装时，必须小心谨慎，切勿损伤霍尔效应器、直接驱动马达定子、转子以及其它组成部件。
5. 更换组装完毕，必须进行再现转换点的调试。

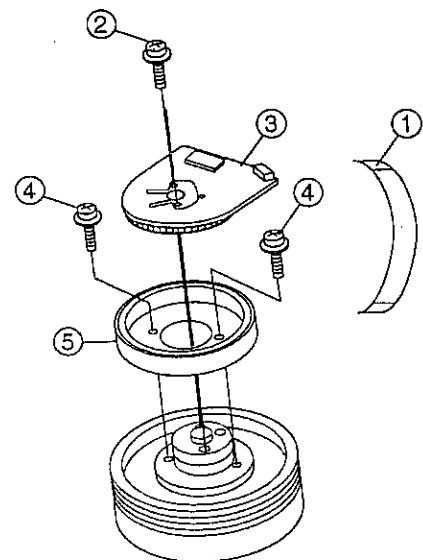


图4-38

## 需要进行下述配相调整的 机械部件的组装

1. 组装紧带轮组件、反转导杆组件和紧带轮传动凸轮。(于机芯底盘前面)
2. 安装移行器。(于机芯底盘背面)
3. 安装主凸轮。(于机芯底盘背面)
4. 安装连接齿轮、慢放制动器以及磁带挂装马达。(于机芯底盘背面)

### 1. 紧带轮组件、反转导杆组件与紧带轮传动凸轮(机芯底盘前面)的组装

按下图所示数字的顺序进行组装。

- (1) 反转传动杆①
- (2) 反转导杆弹簧②
- (3) 反转导杆组件③
- (4) R/G调整螺母④
- (5) 紧带轮传动凸轮⑤
- (6) 紧带轮组件⑥
- (7) 开盖柄⑦

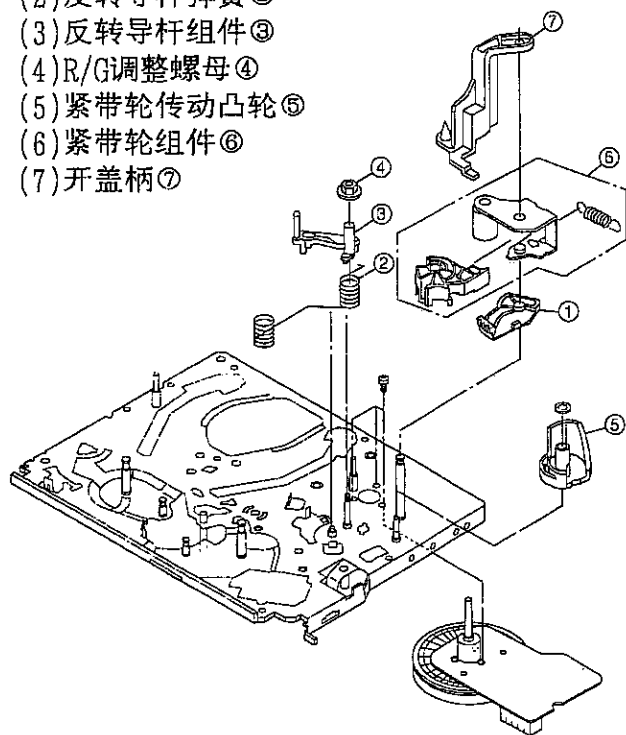
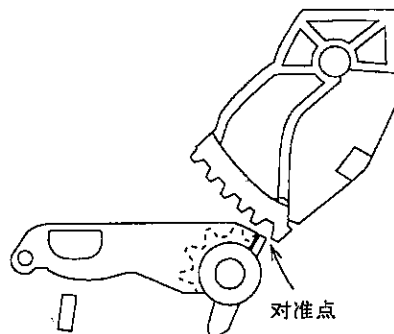


图4-39

#### ①插入倒转导杆组件



#### ②插入紧带轮传动凸轮

逆时针方向旋转反转导杆组件，  
直至碰至停止器为止。

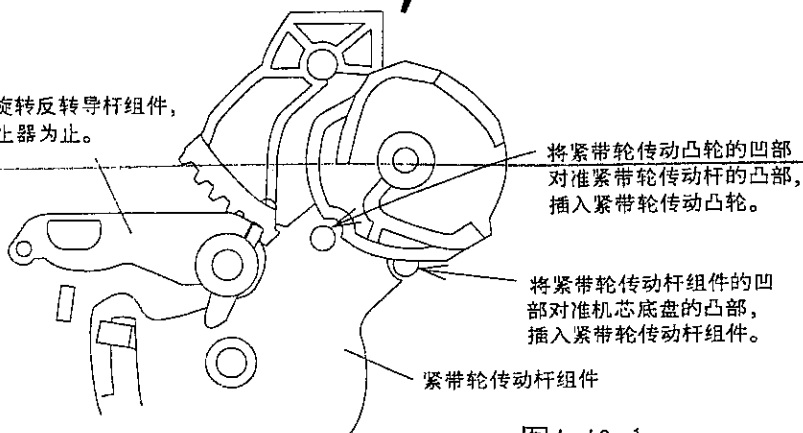


图4-40-1

③插入紧带轮和紧带双动杆组件

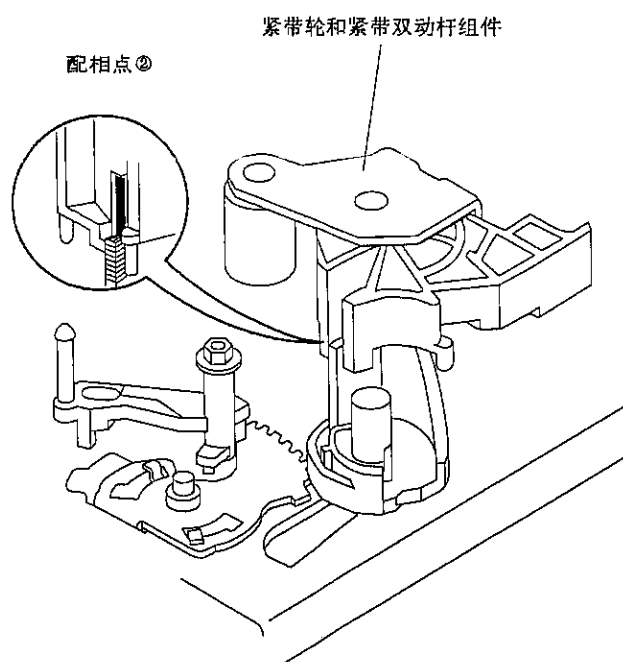


图4-40-2

④插入开盖柄

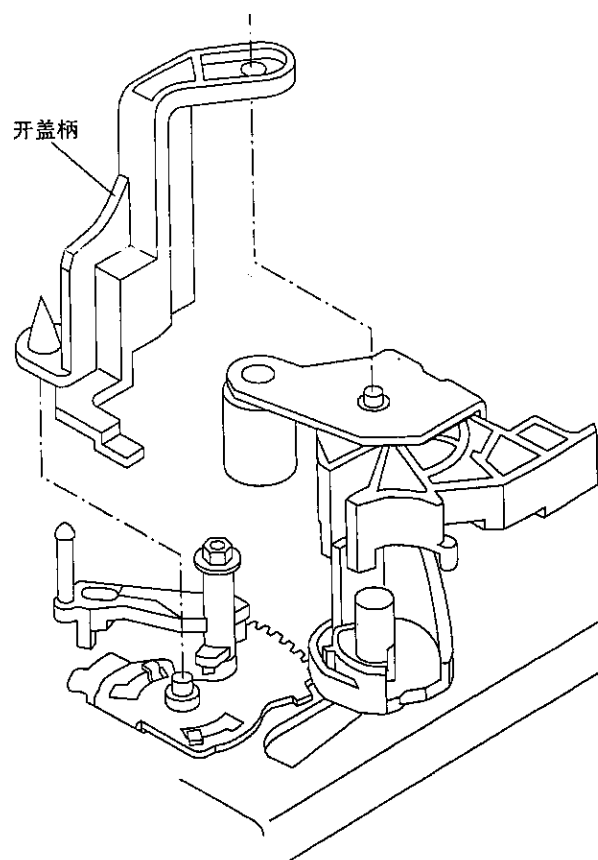


图4-40-3

2. 移行器 (机芯底盘背面) 的组装

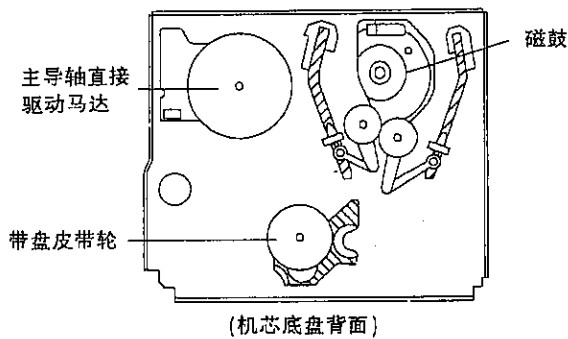


图4-41

1. 检查磁带装挂齿轮是否于下图所示的插孔处①。
2. 按要求安装移行器。这时, 必须注意移行器的6个插孔和3个松解钉。
3. 为在插孔①处进行配相调整, 请见下图的配相点②的说明。
4. 在插孔①和④处加上垫圈, 紧固移行器。

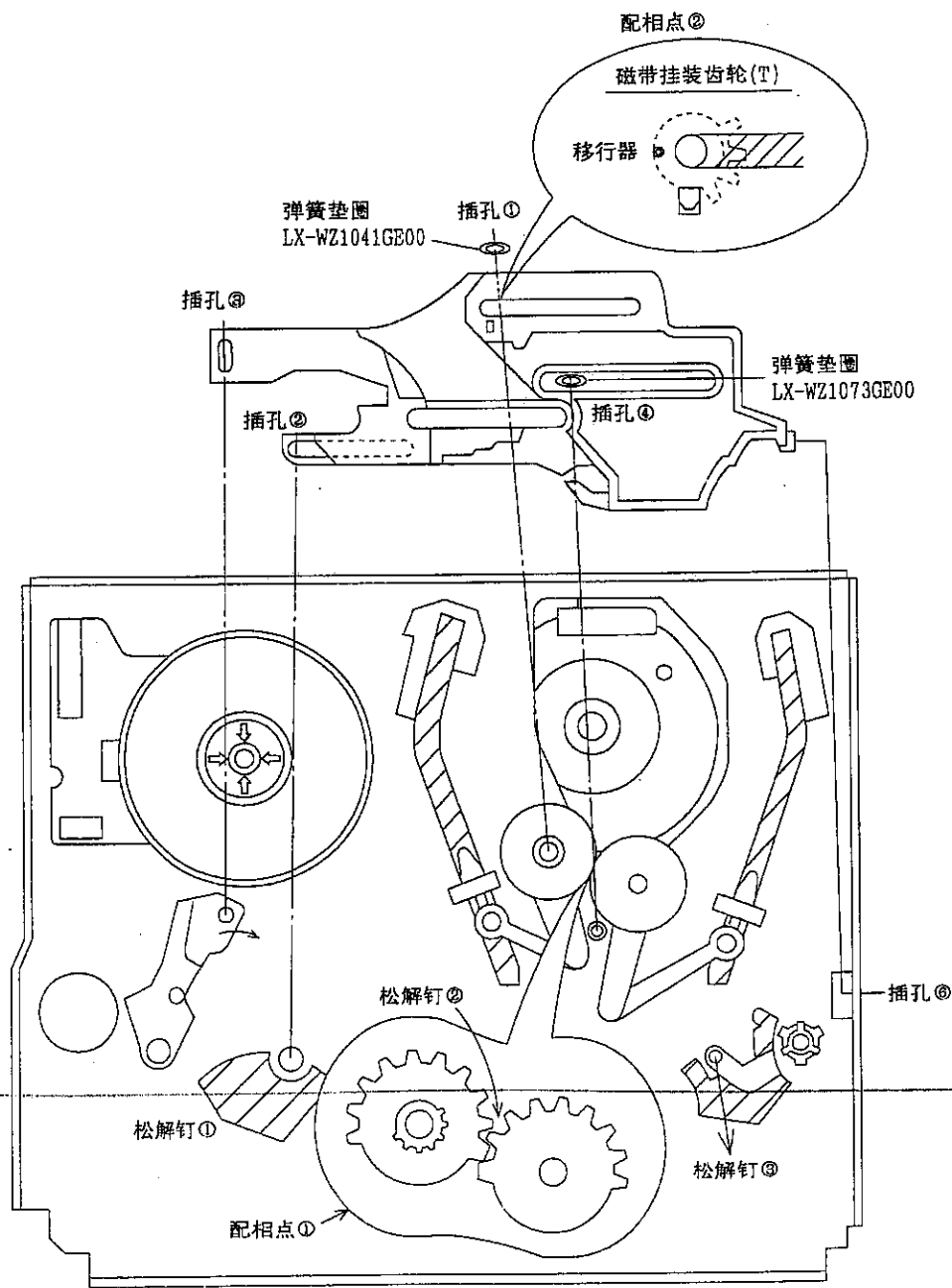


图4-42

### 3. 主凸轮(机芯底盘背面)的安装

- (1) 首先检查移行器位置是否满足下图所示要求。
- (2) 按下图所示要求安装主凸轮。

注意：

如下图所示，调整主凸轮与盒室控制机构传动齿轮间的配相点。

- (3) 加弹簧垫圈，固定主凸轮。

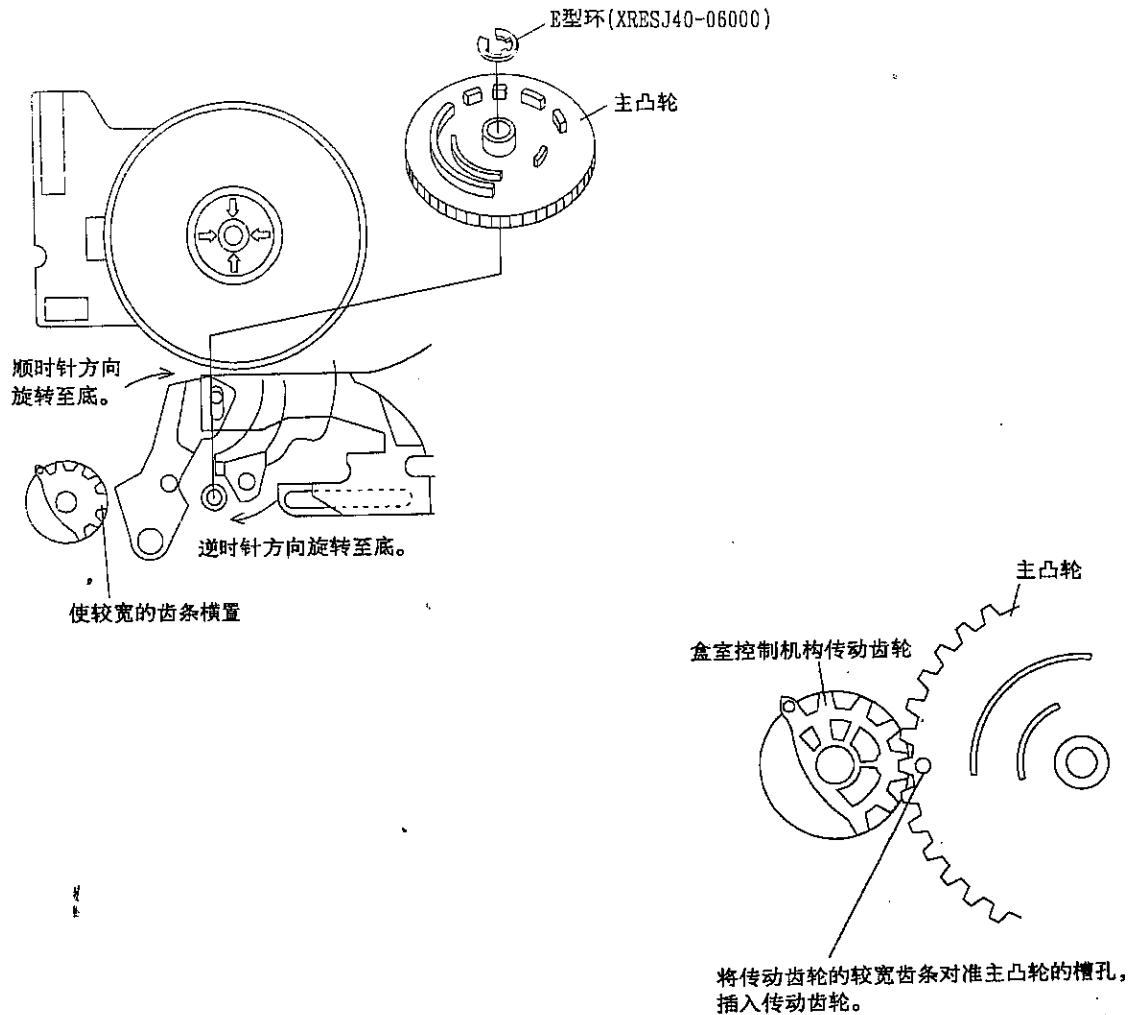


图4-43

磁带装挂马达的更换

- 马达的拆卸
- 松去两支紧固螺丝。

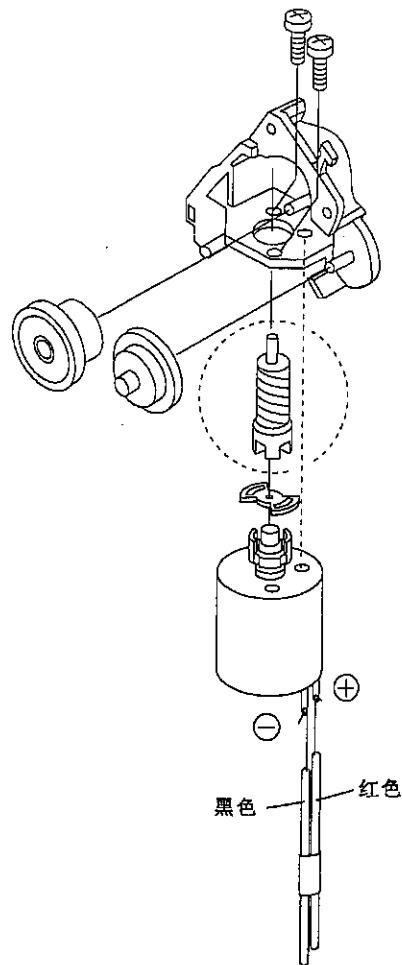


图4-44

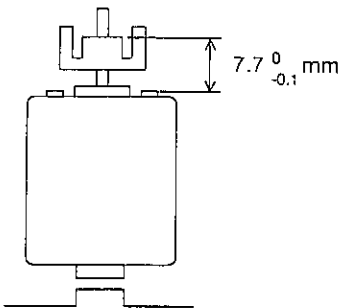


图4-45

用小于98N(10kgf)的力压入磁带装挂马达皮带轮。检查皮带轮是否离马达的间距是否满足  $7.7^{+0}_{-0.1}$  mm的要求。

- 马达的更换
- ① 取出旧的磁带装挂马达。按上图（图4-44）所示要求装换新的磁带装挂马达。

## 盒室控制机构的组装

### ① 框架组件

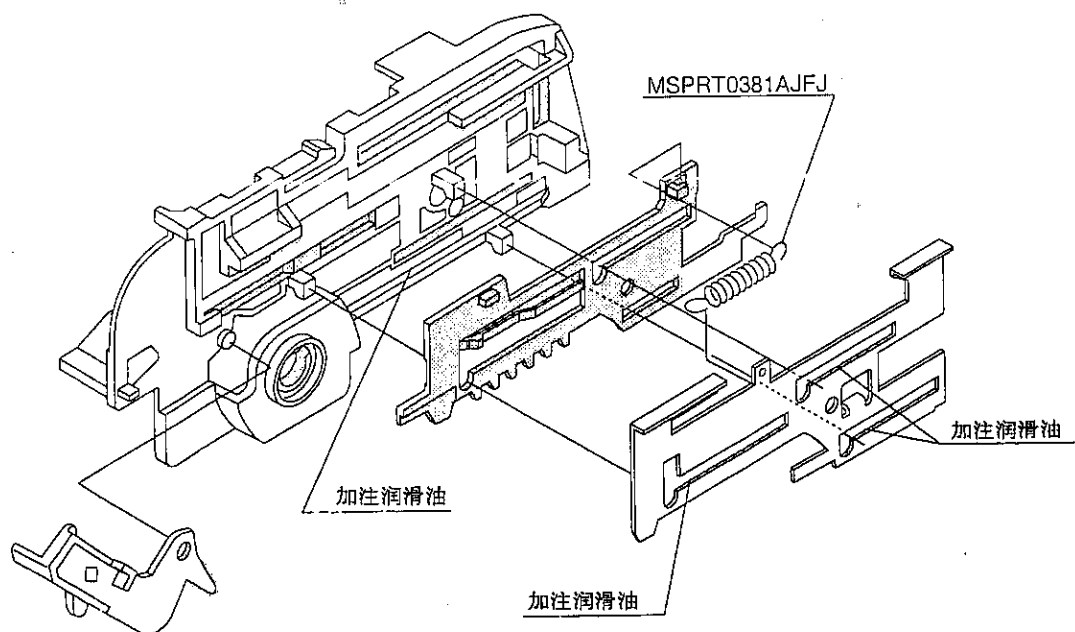


图4-46

② 同步齿轮、左侧传动齿轮和右侧传动齿轮

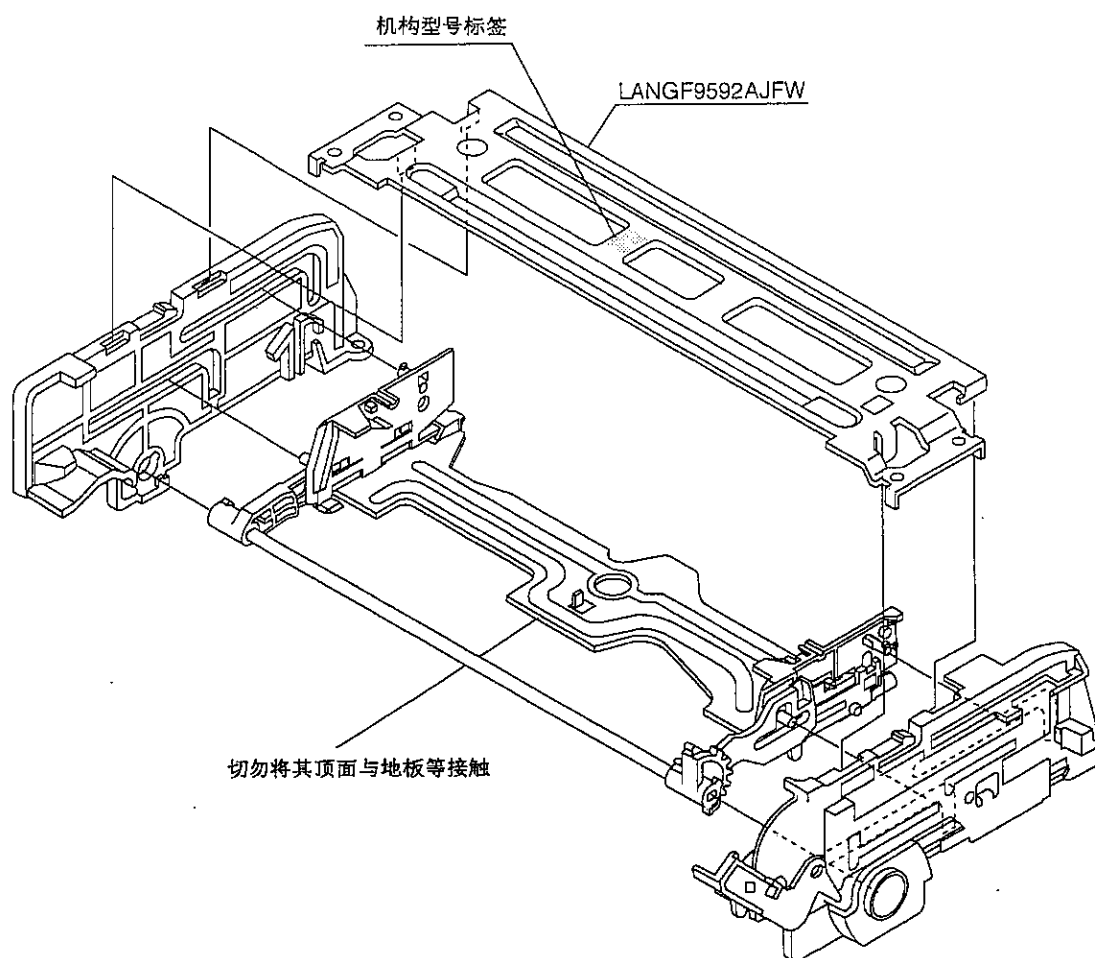


图4-47

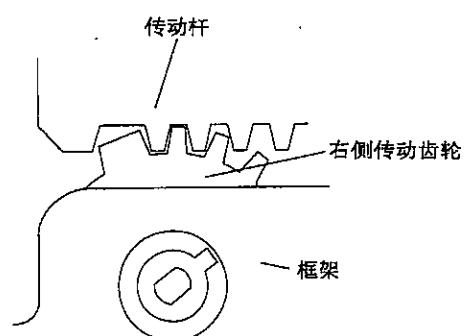


图4-48



## 5 各电路的调试

注：

### ●调试前

在更换录像机磁头之类的电子元件以及机械部件之后，经常需要进行本节所述的电气调试。  
在调试之前，检查机械装置以及所有的电子元件是否处于良好的工作状态，否则，调试不能顺利完成。

### ●需要的检测用仪器

- 彩色电视机监视器
- 音频信号发生器
- 直流伏特计
- 空白录像带
- 调试用螺丝刀
- 彩条信号发生器
- 计频器

### ○双踪示波器

### ○交流毫伏特计

### ○校正用磁带(VROCPSPV)

### ○校正用磁带(VROATSV)

### ○校正用磁带(VROCBFFS)

### ○校正用磁带(VROCPZJS)

### ☆调整注意事项：

定时器电路中的IC703静电可编程式只读寄存器E<sup>2</sup>PROM发生更换时，应按下述要求重编其记忆程序。

按录像机型号而导，IC703的E<sup>2</sup>PROM的记忆程序已于出厂前按规定加以设定。

因此，应根据录像机型号要求，正确设定其记忆功能。

此外，对伺服电路还应进行磁头转换点、慢动作播放以及静止画面的调整。

### ●主电路控制调节与测试点的位置

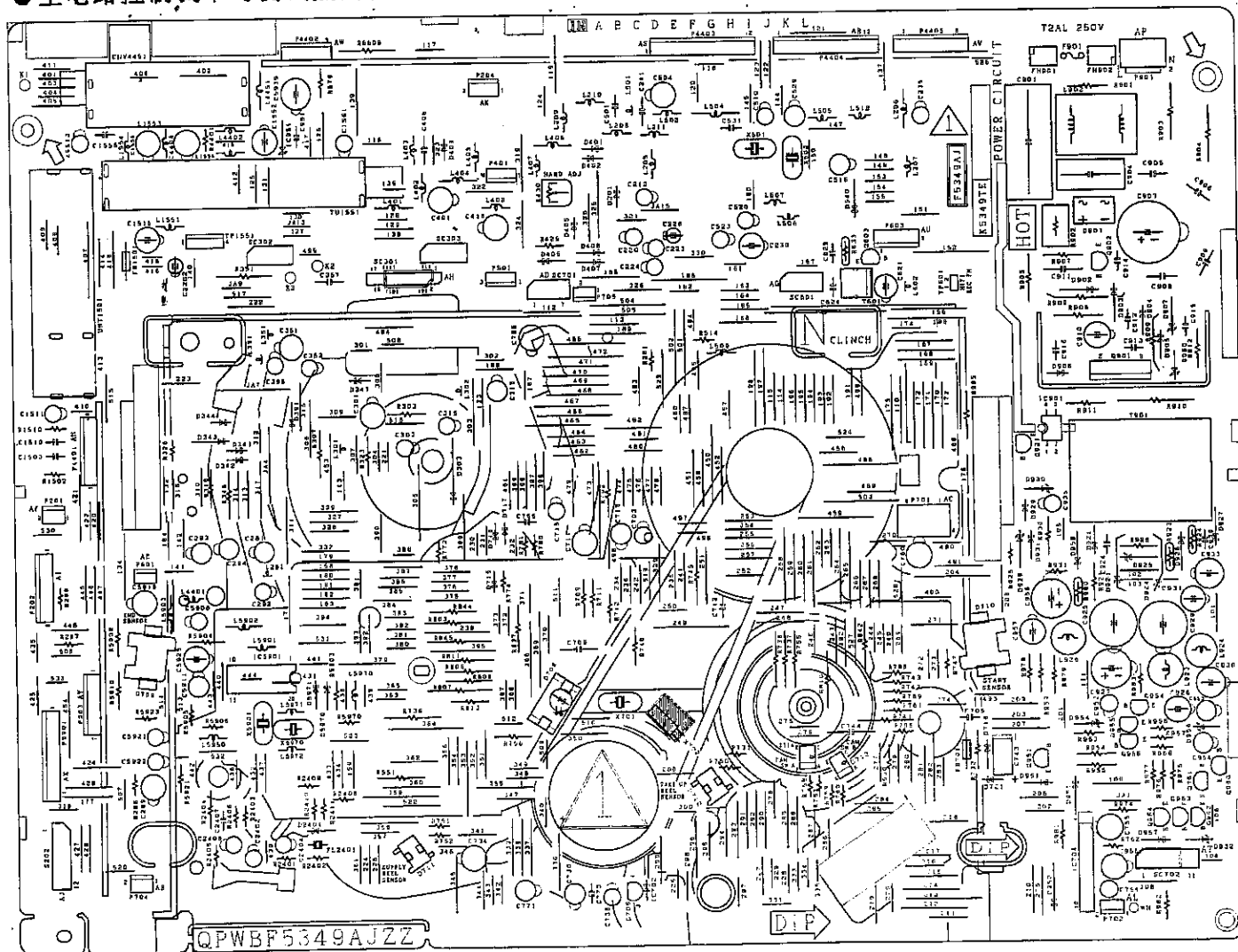


图5-1

## 伺服电路的调整

### PAL制式磁头转换点的调试

检测仪器	双轨迹示波器 监控用彩色电视机
工作状态	再现
使用磁带	校正用磁带(VROCPSV)
测试点	TP502(磁头转换点)接频道-1 视频输出插孔端接频道-2 (频道-1触发倾斜开关于 (+), 内触发于频道-1)
规定要求	$6.5 \pm 0.5H$ (线路)

1. 松开前面板。插入校正用磁带(VROCPSV), 再现之。  
(再见图象表示于监测用电视机荧屏。)
2. 对工作电路印刷电路板上的TP5001与TP5002之间进行瞬间短接处理。  
短接测试点后, 检查REC LED和定时器LED是否点亮。(见下注①)
3. 设录象机于自动调整状态, 触按再现(PLAY)键。
4. 在自动调试中, 检查RED LED是否闪动。
5. 在自动调试完毕后, 检查RED LED是否熄灭。
6. 触按停止(STOP)键, 让录象机返回至正常工作状态。
7. 磁头开关转换点的调整完毕后, 再现校正用磁带, 以检查示波器上呈现的波形是否符合图5-2所示的规定要求。  
所测值不符合规定要求之场合, 再次呼出测试点, 触按快进(FI)键或倒带(REW)键以调至规定要求之范围内。

注:

①调试状态的设定。

磁头转换点的调整过程中, 自动跟踪功能无效。

②盒室控制机构被取出状态下, 机械工作状态的设定。

- 1) 几分钟后再重新插入电源引线插头。
- 2) 短接工作电路印刷电路板上的TP5005与TP5006之间, 使跟踪控制处于中央位置。
- 3) 插入电源引线插头。
- 4) 这样, 便可得机械动作状态。

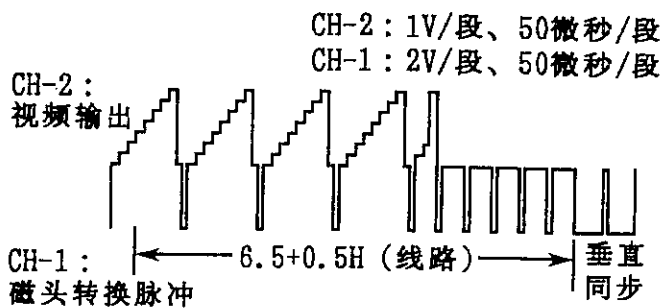


图5-2

PAL制式SP(标准)/LP(慢速)方式跟踪预设的调试

检测仪器	监控用彩色电视机
工作状态	再现
使用磁带	自录磁带 (SP/LP方式) (见下注)
调整点	磁迹跟踪键 (+) 或 (—)
规定要求	监控用彩色电视机荧 屏上噪声线最小程度。

1. 设录象机于电视台节目接收状态, 或向其视频输入端输入视频信号。
2. 用遥控器设录象机于SP(标准)走带方式, 装入自录磁带录象之。
3. 录象后, 倒带, 再现其录象信号。
4. 触按遥控器上的慢放(SLOW)键, 慢动作再现之。
5. 对工作电路印刷电路板上的TP5001与TP5002之间进行瞬间短接处理。  
短接测试点后, 检查REC LED和定时器LED是否点亮。
6. 观察监控用电视机荧屏, 触按磁迹跟踪键(+)或(—), 将荧屏上呈现的噪声线(雪花)调至最小程度。
7. 触按再现(PLAY)键, 让录象机返回至正常工作状态。
8. 以标准状态再现录象带数秒后, 再触按慢放(SLOW)键, 检查电视荧屏上的噪声线是否明显。

(LP方式的调整亦按与SP方式的调整方法相同进行之)。

注:

自录磁带意指于电路调整状态时录象用磁带。

PAL制式静止画面FV（虚假垂直同步）的调试。

检测仪器	监控用彩色电视机
工作状态	再现状态静止画面
使用磁带	自录磁带(SP方式) (见下注)
调整点	磁迹跟踪键(+)或(-)
规定要求	电视荧屏上无垂直晃抖

1. 装入自录磁带，用SP方式录象后，再现之。
2. 触按暂停/静止(PAUSE/STILL)键，静止再现图象。
3. 观察监控用电视机荧屏，触按磁迹跟踪键(+)或(-)，将荧屏上呈现的噪声线(雪花)调至最小程度。
4. 用SP方式再现自录磁带，静止再现图象，检查电视荧屏上的噪声线是否明显。  
(LP方式的调整亦按与SP方式的调整方法相同进行之)。

注：

自录磁带意指于电路调整状态时录象用磁带。

NTSC制式磁头转换点的调试

检测仪器	双轨迹示波器 监控用彩色电视机
工作状态	再现
使用磁带	校正用磁带(VROATSV)
测试点	TP502(磁头转换点)接频道-1 视频输出插孔端接频道-2 (频道-1触发倾斜开关于 (+), 内触发于频道-1)
规定要求	$6.5 \pm 0.5H$ (线路)

1. 松开前面板。插入校正用磁带(VROATSV)，再现之。  
(再现图象表示于监测用电视机莹屏。)
2. 对工作电路印刷电路板上的TP5001与TP5002之间进行瞬间短接处理。  
短接测试点后，检查REC LED和定时器LED是否点亮。(见下注①)
3. 设录象机于自动调整状态，触按再现(PLAY)键。

4. 在自动调试中，检查RED LED是否闪动。
5. 在自动调试完毕后，检查RED LED是否熄灭。
6. 触按停止(STOP)键，让录象机返回至正常工作状态。
7. 磁头开关转换点的调整完毕后，再现校正用磁带，以检查示波器上呈现的波形是否符合图5-3所示的规定要求。  
所测值不符合规定要求之场合，触按快进(F.F)键或倒带(REW)键以调至规定要求之范围内。

注：

- ① 调试状态的设定。  
磁头转换点的调整过程中，自动跟踪功能无效。
- ② 盒室控制机构被取出状态下，机械工作状态的设定。  
1) 几分钟后再重新插入电源引线插头。  
2) 短接工作电路印刷电路板上的TP5005与TP5006之间，使跟踪控制处于中央位置。  
3) 插入电源引线插头。  
4) 这样，便可得机械动作状态。
- ③ 如果已经调整过PAL制式磁头转换点，即不需调整NTSC制式磁头转换点。  
边观察测试点上显示出的波形边检查是否符合规定要求。

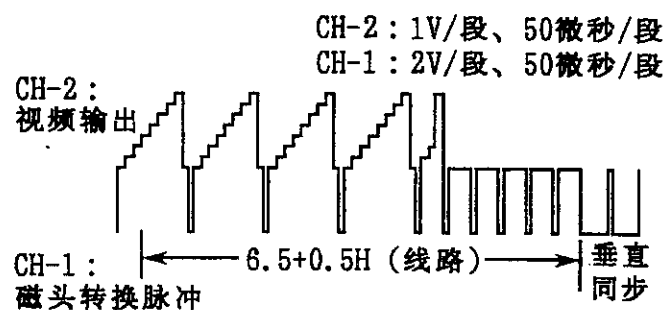


图5-3

NTSC制式SP（标准）/EP（慢速）方式跟踪预设的调试。

检测仪器	监控用彩色电视机
工作状态	再现
使用磁带	自录磁带（SP/EP方式） （见下注）
调整点	磁迹跟踪键（+）或 （—）
规定要求	监控用彩色电视机荧 屏上噪声线最小程度。

1. 设录象机于电视台节目接收状态，或向其视频输入端输入视频信号。
2. 用遥控器设录象机于SP（标准）走带方式，装入自录磁带录象之。
3. 录象后，倒带，再现其录象信号。
4. 触按遥控器上的慢放（SLOW）键，慢动作再现之。
5. 对工作电路印刷电路板上的TP5001与TP5002之间进行瞬间短接处理。  
短接测试点后，检查REC LED和定时器LED是否点亮。（见下注①）
6. 观察监控用电视机荧屏，触按跟踪键（+）或（—），将荧屏上呈现的噪声线调至最小程度。
7. 触按再现（PLAY）键，让录象机返回至正常工作状态。
8. 以标准状态再现录象带数秒后，再触按慢放（SLOW）键，检查电视荧屏上的噪声线是否明显。  
（EP方式的调整亦按与SP方式的调整方法相同进行之）。

注：

自录磁带意指于电路调整状态时录象用磁带。

NTSC制式静止画面FV（虚假垂直同步）的调试

检测仪器	监控用彩色电视机
工作状态	再现状态静止画面
使用磁带	自录磁带（SP/EP方式） （见下注）
调整点	磁迹跟踪键（+）或（—）
规定要求	电视荧屏上无垂直晃抖

1. 装入自录磁带，用SP方式录象后，再现之。
2. 触按暂停/静止（PAUSE/STILL）键，静止再现图象。
3. 观察监控用电视机荧屏，触按磁迹跟踪键（+）或（—），将荧屏上呈现的噪声线（雪花）调至最小程度。
4. 用SP方式再现自录磁带，静止再现图象，检查电视荧屏上的噪声线是否明显。  
（EP方式的调整亦按与SP方式的调整方法相同进行之）。

注：

自录磁带意指于电路调整状态时录象用磁带。

NTSC制式歪斜补偿的调整

检测仪器	监控用彩色电视机
工作状态	再现状态静止画面（SP方式）
使用磁带	校正用磁带（VROATSV）
调整点	R5410（闪烁控制）
规定要求	监控用电视机荧屏上无闪烁现象

1. 装入校正用磁带（VROATSV），设录象机于再现静止状态。
2. 观察监控用电视机荧屏，调节R5410，使荧屏上的图象闪烁现象调至最小程度。

## 亮度/色度信号电路的调整

### 视频 E—E 增益的调整

测量仪器	示波器
工作状态	E—E 或录象
输入信号	EIA 彩条 (1.0 V <sub>p-p</sub> PAL 和 NTSC)
测试点	视频输出端
规定要求	1.0 ± 0.2 V <sub>p-p</sub>

1. 将 75Ω 端电阻接到视频输出端, 再接示波器两探针于该电阻两端。(见下注)
2. 输入彩条信号到视频输入端。
3. 让 E—E 信号的振幅达到如图 5—4 所示的 1.1 V<sub>p-p</sub> 的规定要求。
4. 对 NTSC 制式而言, 其调整方法与 PAL 制式相同。

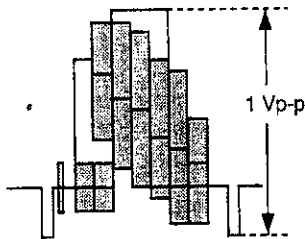


图 5—4

注: 如果不接 75Ω 端电阻, 则输出波形幅值应为上述值的两倍。

### 白色限幅的调整

测量仪器	示波器
工作状态	E—E 或录象 (PAL LP/NTSC EP 方式)
输入信号	EIA 彩条 (1.0 V <sub>p-p</sub> PAL 和 NTSC)
测试点	IC401 的 (48) 脚, GND
规定要求	190 ± 5% (见下注)

1. 在 IC401 芯片的 (48) 脚与 GND 之间接示波器。
2. 设录象机于 E—E 或录象状态。向视频输入端输入彩条信号。
3. 检查视频信号过调量的限幅是否符合图 5—5 所示的 190% 的规定要求。
4. 对 NTSC 制式而言, 其调整方法与 PAL 制式相同。

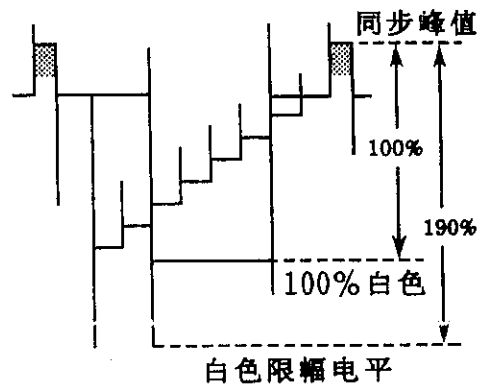


图 5—5

注: 从同步峰值至白色峰值, 其电平为 100%。于白色电平之上, 白色限幅电平为 90%。

### 记录电平的调整

测量仪器	双踪示波器
工作状态	记录 (录象) 方式 (PAL LP/NTSC EP 状态)
输入信号	EIA 彩条 (1.0 V <sub>p-p</sub> PAL 和 NTSC)
测试点	色度 (红) R514 电阻与 L509 的连接点 ~ GND 同步信号峰值 R225 电阻与 L210 的连接点 ~ GND
规定要求	色度 (红): 170 ± 230 mV <sub>p-p</sub> 同步信号峰值: 720 ± 880 mV <sub>p-p</sub>

1. 设录象机于记录状态。向视频输入端输入彩条信号。
2. 用双踪示波器测量上表中的每一点。
3. 让色度 (红) 及同步信号顶部的振幅达到如图 5—6 所示的规定要求。
4. 对 NTSC 制式而言, 其调整方法与 PAL 制式相同。

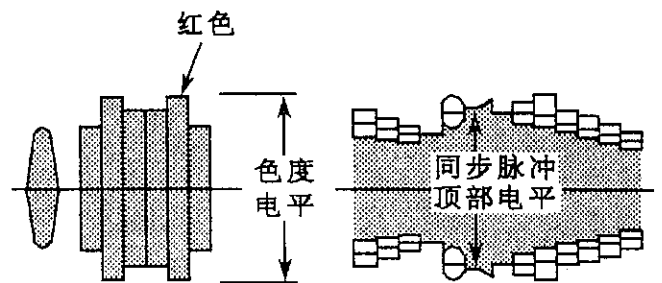


图 5-6(a)

图 5-6(b)

再现增益的调整

检测仪器	示波器
工作状态	记录/再现 (PAL LP/NTSC EP 状态)
输入信号	EIA 彩条 (1.0V <sub>p-p</sub> PAL 和 NTSC)
测试点	视频输出端
规定要求	1.0±0.2 V <sub>p-p</sub>

- 1. 先确认 E—E 电平的调试已符合规定要求。
- 2. 在视频输出插孔端接一只 75Ω 终端电阻。示波器跨接此终端电阻。(见下注)
- 3. 向视频输入插孔端输入彩条信号。设录象机于记录状态。
- 4. 再现记录有输入彩条信号部分的磁带内容。
- 5. 检查这时的输出信号幅值是否符合图 5—7 所示的 1.1V<sub>p-p</sub> 的规定要求。
- 6. 对 NTSC 制式而言,其调整方法与 PAL 制式相同。

注:如果不接 75Ω 端电阻,则输出波形幅值应为上述之两倍。

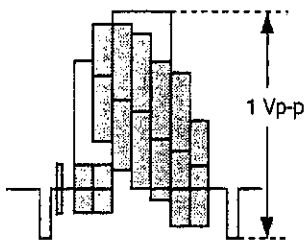


图 5—7

超高画质图象的调试

检测仪器	单象管图案
工作状态	记录/再现 (PAL SP 状态)
使用磁带	校正用磁带 (VROCPSV)
测试点	TP402 (信号) ~TP403 (接地)
调整点	R430 (超高画质图象控制)
规定要求	—————

- 1. 在SP状态下记录PAL制式单象管图案信号,再现之。
- 2. 接1兆Ω电阻器于测试点TP402(信号)与TP403(接地)之间。
- 3. 在监控用彩色电视机荧屏上呈现无瑕的图象后,缓慢地旋转R430(超高画质图象控制),直至其无瑕的图象呈杂乱状态为止。
- 4. 拆开电阻器,最后检查荧屏上呈现的图象是否回复至无瑕的图象。

## Hi-Fi 音频电路的调试

## Hi-Fi 音频电路调整的注意要点

1. 下述各项调整步骤均以左声道的调整为说明对象。右声道的调整基本与其相同，步骤说明在此省略。

记于括号“[ ]”中的数值、代号等是右声道省略了说明的调整数值、代号等。

## 2. Hi-Fi 音频电路模块的测试调整

## 1) 记录工作状态

在此工作状态下用录象带记录电视节目的立体声信号，并为其作控制调节。

## 2) 再现工作状态

在此工作状态下播放录有Hi-Fi内容的录象带，并为其作控制调节。

(可通过遥控器上的项目(MENU)键或录象机前面的设定(SET UP)键选定音频输出声道于再现工作状态。

再通过(+)或(-)键对音频输出方式进行选定。触按(+)或(-)键选定音频输出方式于“Hi-Fi L+R”(左右两声道Hi-Fi)。这样,左右两声道均被设定于Hi-Fi输出方式。选定结束后,多功能显示器上左右声道指示器分别点亮。)

## ● 控制调节与测试点的位置

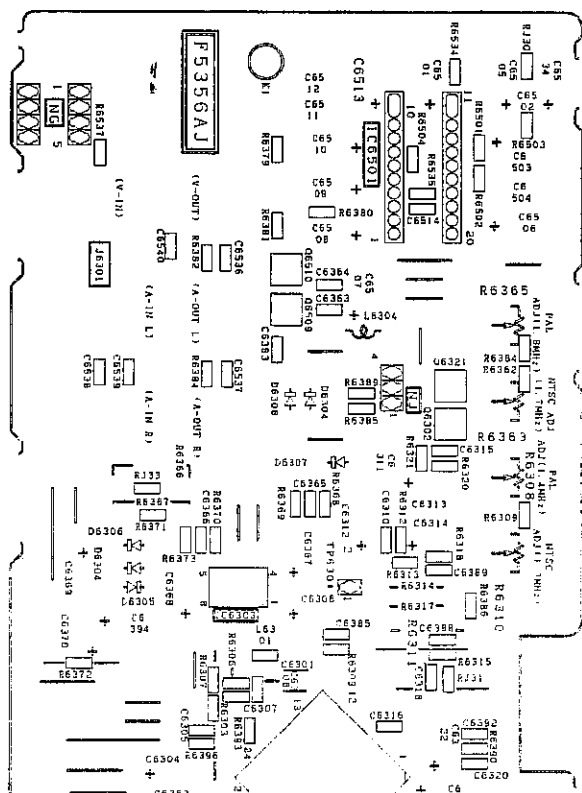


图5-8

## E-E电平的调试

检测仪器	交流毫伏特计
工作状态	E-E或记录(录象)
输入信号	1kHz, -8dBs
测试点	音频输出插孔
规定要求	-8 ± 2dBs

1. 向音频输入插孔的左声道终端输入上表所述的音频信号。

2. 接交流毫伏特计于音频输出插孔的左右声道终端。

3. 设录象机于E-E或记录(录象)状态。检查交流毫伏特计所测的读数是否符合上表所述的规定要求。

(检查其电平是否满足规定值-2dB的规定要求)。

## FM载波频率的调试

检测仪器	计频器
工作状态	E-E或记录(录象)
输入信号	无规定要求
测试点	TP6301(信号)~TP6302(接地)
调整点	R6310 [R6363] NTSC制式 载波频率控制 R6308 [R6365] PAL制式 载波频率控制
规定要求	1.3 [1.7] MHz ± 5kHz (NTSC制式) 1.4 [1.8] MHz ± 5kHz (PAL制式)

1. 设录象机于A/V(声象)输入状态。切勿向视频输入插孔输入任何信号。(拆去视频输入端的所有接线。)

2. 设录象机于E-E或记录(录象)状态。接计频器于测试点TP6301(信号)和TP6302(接地)。

3. 设录象机于NTSC制式, 调节R6310 [R6363] (NTSC制式载波频率控制), 使计频器所测的读数达至上表所述的规定要求。

4. 再设录象机于PAL制式, 调节R6308 [R6365] (PAL制式载波频率控制), 使计频器所测的读数达至上表所述的规定要求。

### 线性音频再现电平的调试

检测仪器	交流毫伏特计
工作状态	再现
输入信号	校正用磁带(VROCPZJS)
测试点	音频输出插孔
规定要求	$-12.0 \pm 2\text{dBs}$

1. 接交流毫伏特计于音频输出插孔。
2. 装入校正用磁带(VROCPZJS), 再现之。
3. 检查交流毫伏特计所测的音频输出电平值是否符合规定要求。

所测值不符合规定要求之场合, 则检查偏流。

### Hi-Fi音频再现电平的调试

检测仪器	交流毫伏特计
工作状态	再现
输入信号	校正用磁带(VROCBFFS)
测试点	音频输出插孔
规定要求	$-8.0\text{dBs} \pm 2\text{dBs}$

1. 接交流毫伏特计于音频输出插孔。
2. 装入校正用磁带(VROCBFFS), 再现之。
3. 检查交流毫伏特计所测的音频输出电平值是否符合规定要求。

注意: 检查左右声道的再现电平值均为不大于 2.0dB。

### Hi-Fi/标准音频自录/再现电平的调试

检测仪器	交流毫伏特计
工作状态	记录(录象)/再现
输入信号	1kHz, $-8.0\text{dBs}$
测试点	音频输出插孔
规定要求	$-8.0\text{dBs} \pm 3\text{dBs}$

1. 向音频输入插孔的左声道终端输入上表所述的音频信号。
2. 接交流毫伏特计于音频输出插孔的左声道和右声道终端。
3. 检查交流毫伏特计所测的读数是否符合规定要求。

注意: 检查左右声道的再现电平值均为不大于 2.0dB。

### 消磁电压和振荡频率的调试

检测仪器	示波器
工作状态	记录(录象)
测试点	完全消磁磁头
调整点	T6301
规定要求	$70 \pm 5\text{kHz}$ , 大于 $40\text{Vp-p}$

1. 设录象机于记录(录象)状态。
2. 接示波器于完全消磁磁头之两端。
3. 检查其磁头两端的消磁电压是否近似于或大于  $40\text{Vp-p}$ , 以及频率为  $70 \pm 5\text{kHz}$ 。

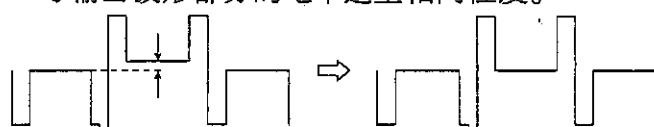


## 液晶显示器(LCD)电路的调试

### 对比度电路的调试

检测仪器	示波器
工作状态	E-E
输入信号	PAL制式视频信号(50%白色)
测试点	TP8941(绿色信号输出端)~GND(接地端)(TP8943)
控制	R8902(对比度控制)
规定要求	亮度信号电平应为相同程度(+0.1 Vp-p)。

1. 在声象(A/V)状态下,向视频输入端输入PAL制式视频信号(50%白色)。
2. 接示波器于TP8941(绿色信号输出端)与GND(接地端)之间。调节R8902(对比度控制),使标准白色信号部分与翻转的绿色信号输出波形部分的电平达至相同程度。



旋转R8902,以达至相同程度的电平值。

图5-9

### 水平位置的调试

检测仪器	彩色电视机监视器
工作状态	再现状态
使用磁带	校正用磁带(VROCPSV)
控制	R9021(水平位置控制)
规定要求	单象管图案应位于荧屏的中央部

1. 装入校正用磁带(VROCPSV),再现之。
2. 边观察监控用彩色电视机边旋转R9021(水平位置控制),直至单象管图案移至荧屏的中央部为止。

### 共用偏转的调试(精调)

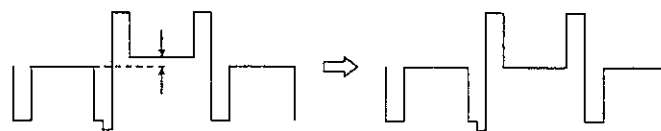
检测仪器	直流伏特计
工作状态	E-E
输入信号	PAL制式视频信号(50%白色)
测试点	TP9045(共用偏转控制)
控制	R9061(共用偏转控制)
规定要求	$1.5 \pm 0.1 \text{ Vp-p}$

1. 在声象(A/V)状态下,向视频输入端输入PAL制式彩条信号。接直流伏特计于TP9045(共用偏转控制)与GND(接地端)之间。
2. 旋转R9061(共用偏转控制),使直流伏特计所测的读数达至 $1.5 \text{ V} \pm 0.1 \text{ Vp-p}$ 的规定要求。

### 白色平衡的调试

检测仪器	示波器
工作状态	E-E
输入信号	PAL制式视频信号(50%白色)
测试点	TP8941(绿色信号输出端)~GND(接地端), TP8940(绿色信号输出端)~GND(接地端), TP8942(蓝色信号输出端)~GND(接地端)
控制	R8966(副亮度红色控制) R8961(副亮度蓝色控制)
规定要求	亮度信号电平应为相同程度(+0.1 Vp-p)。

1. 该调整应在对比度调整完毕后进行。
2. 调录象机于声象信号输入状态,向视频输入端输入PAL制式视频信号(白色50%)。
3. 接示波器于TP8940与GND(接地端)之间。再接示波器于TP8942与GND(接地端)之间。然后调节8966(前者)和R8961(后者),使各亮度信号电平达至相同程度。



分别调节R8966和R8961,使两者的信号电平达至相同程度。

图5-10

彩色同步信号的调试 (仅限于PAL制式)

检测仪器	示波器
工作状态	E-E (蓝色背景状态)
输入信号	无信号
控 制	C8911 (PAL制式彩色同步信号控制)
规定要求	调至水平噪声线消失为止。

1. 设液晶显示板荧屏于PAL制式的蓝色背景状态。
2. 观察液晶显示板荧屏，调节C8911，直至完全消失水平噪声线为止。  
(必须设定于PAL制式。在NTSC制式的蓝色背景状态下旋转C8911亦不会出现变化。)

共用偏转的调试 (微调)

检测仪器	彩色电视机监视器
工作状态	E-E
输入信号	NTSC制式10阶梯波视频信号
控 制	R9021 (水平位置控制)
规定要求	消去荧屏上的垂直线条

1. 在声象 (A/V) 状态下，向视频输入端输入NTSC制式10阶梯波视频信号。
2. 边观察监控用彩色电视机边缓慢地旋转R9061 (共用偏转控制)，直至荧屏上消去垂直线条为止。

注意：  
切勿快速地旋转控制旋钮，否则不能观察进行变化的图象。

## 射频电路

### 射频 AGC 电路调试

检测仪器	示波器
工作状态	良好的电视工业广播接收方式
测试点	TP1553 (信号) TP1554 (地) (位于主印刷电路板中)
控制	VR101 射频 AGC 控制 (位于中频包电路中)
规定要求	恰好在收缩之前(见图 5—9)

1. 让录像机接收到电视工业广播信号。(输入场强: 85dB $\mu$ V 天线端)。
2. 接示波器于测试点 TP1553(信号)与 TP1554(地)之间。
3. 在示波器上观察视频输出端的波形。调节位于中频包电路中的 VR101(射频 AGC 控制),直到示波器屏上的噪声消失为止,且该波形几乎进入同步。

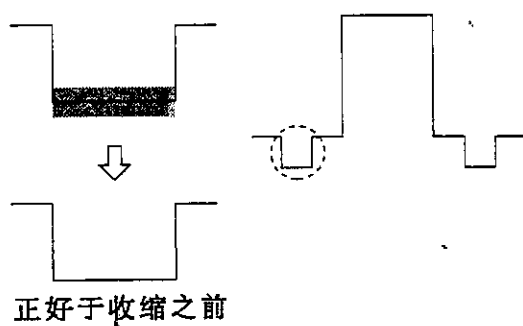


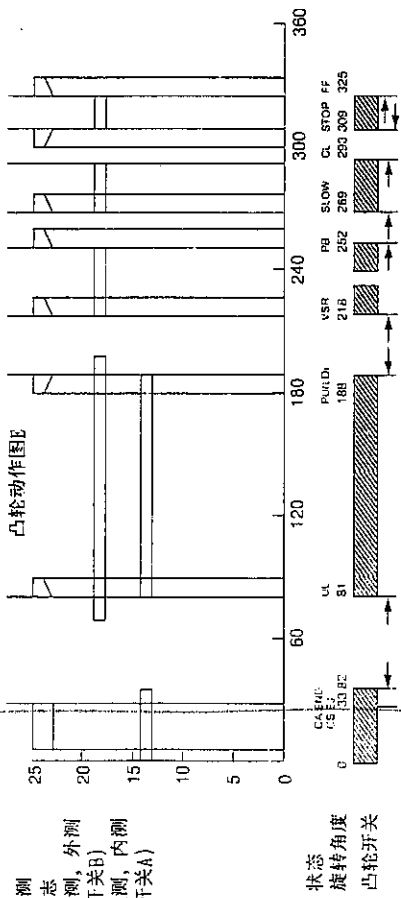
图5-11

### 音频电平调谐器的检查

1. 在 TV Through 方式或 VCR E—E 方式下,对其音量进行比较是否相同。
2. 如果音量不相同,则调节中频包电路中的 VR102,使得两者音量完全相同。

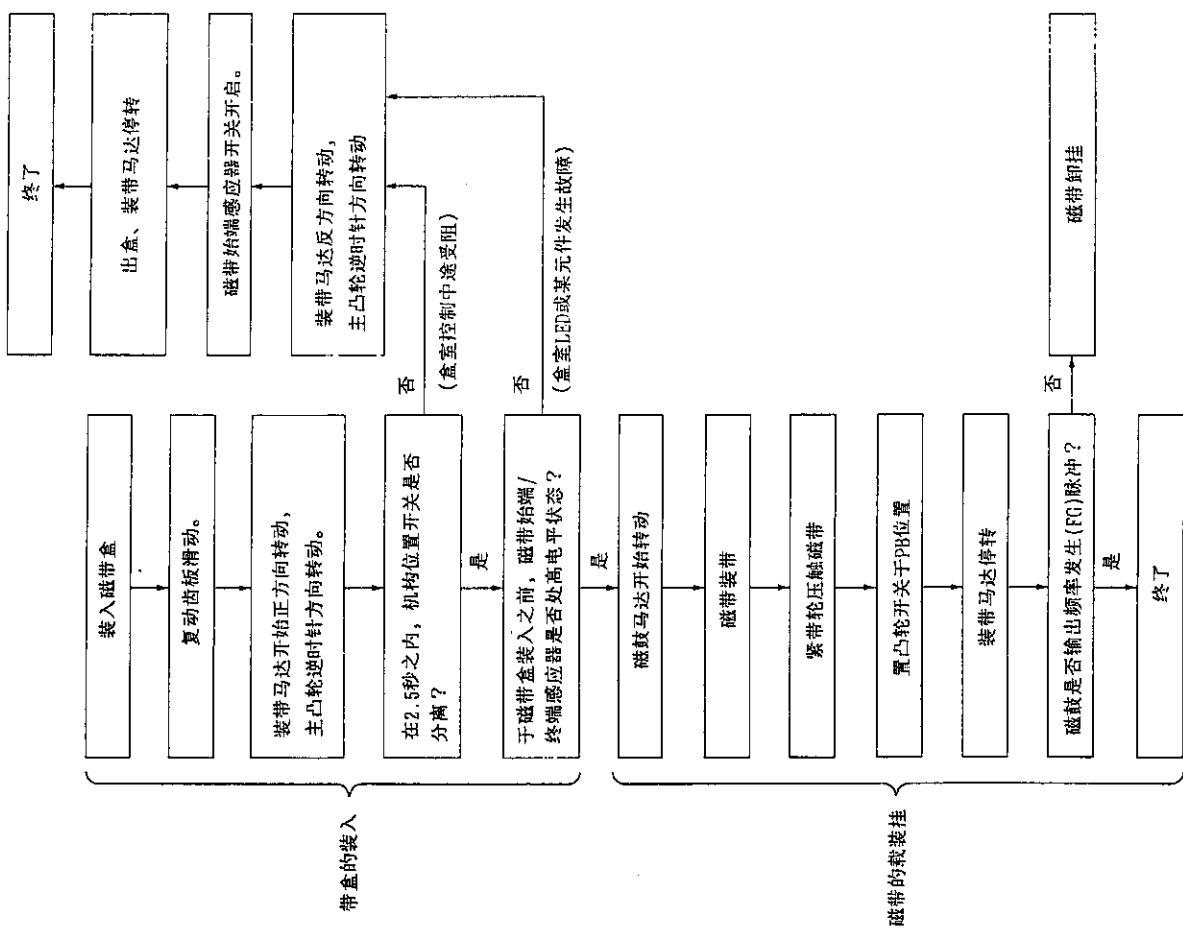
### 装入录象磁带→动作停止

状态检测  
凸轮标志  
状态检测  
(D709开关)  
状态检测  
(D708开关)

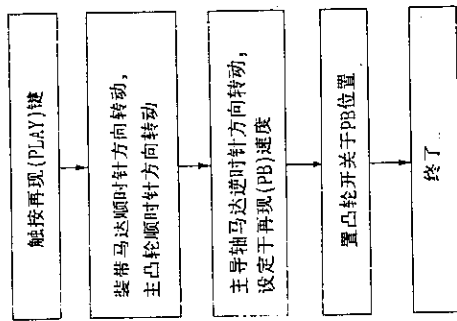


	EU	UL	PU	WSB	P9	S <sub>06</sub>	CA	STP	FF
状态检测, 外测	0	0	1	1	0	0	1	0	1
状态检测, 内测	1	0	1	1	0	1	0	1	0
S感应器	1	0	1	1	0	0	1	0	1

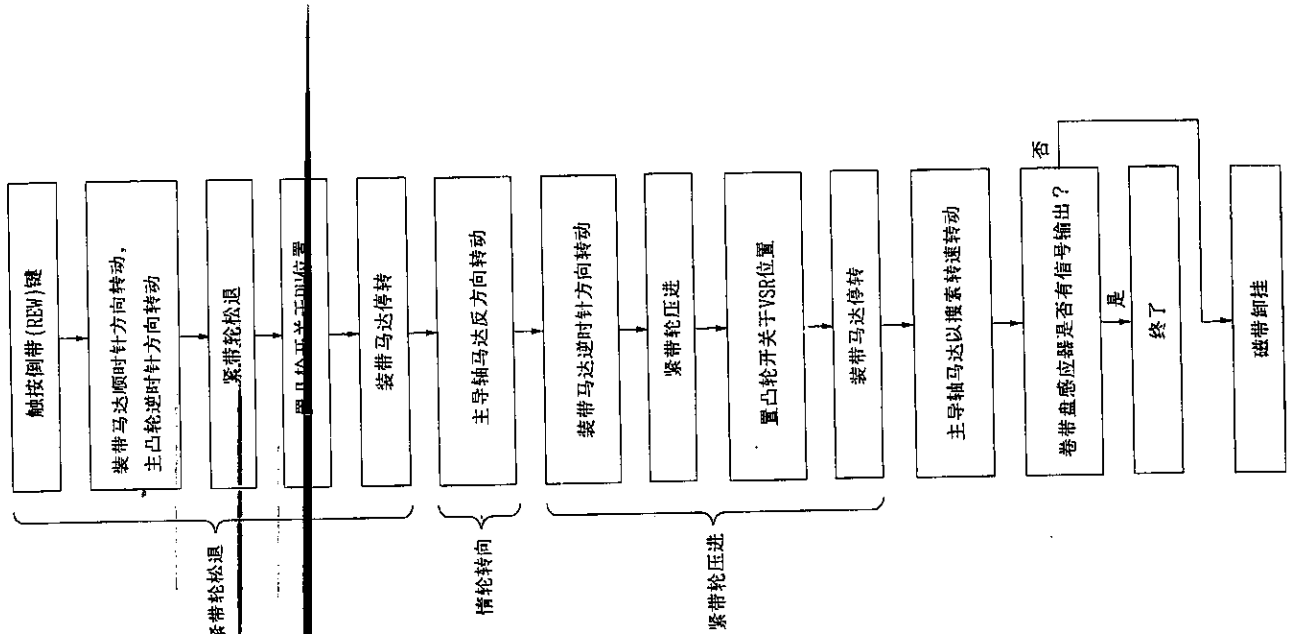
	状态检测, 内测 感应器A	状态检测, 外测 感应器B
CSEJ	1	0
ULD	1	1
PU LD	1	1
VSR	0	1
PB	0	0
STILL	0	1
CL	0	0
STOP	0	0
FF	0	0



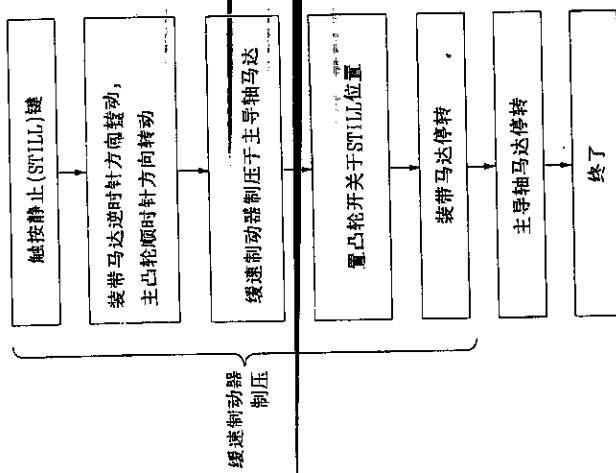
再现→视频搜索倒带→再现



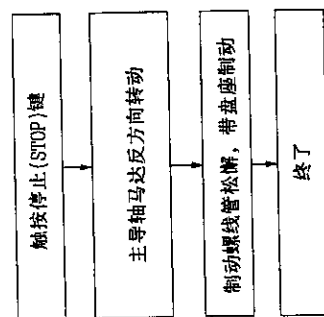
再现→视频搜索倒带



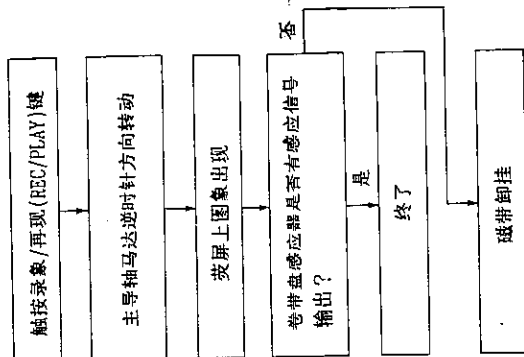
再现状态→静止



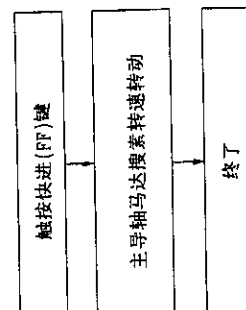
倒带→停止状态



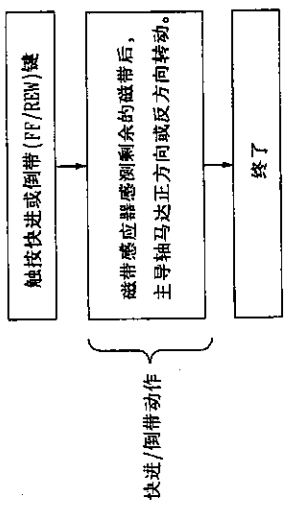
停止状态→录像/再现



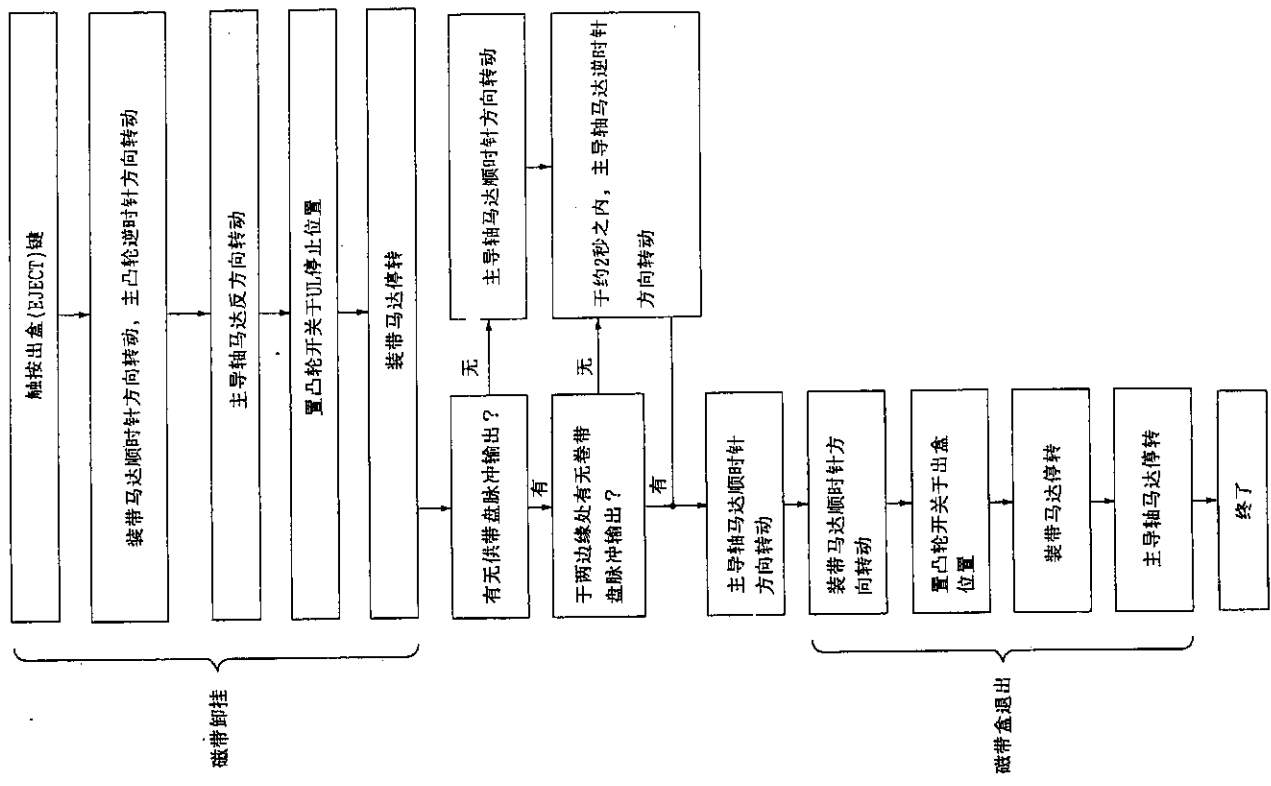
再现→视频搜索快速进



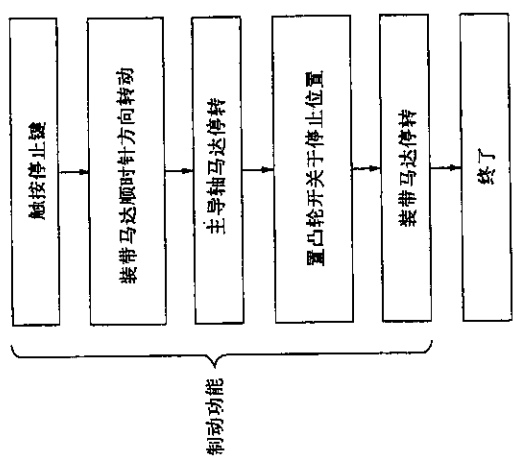
停止状态→快进/倒带



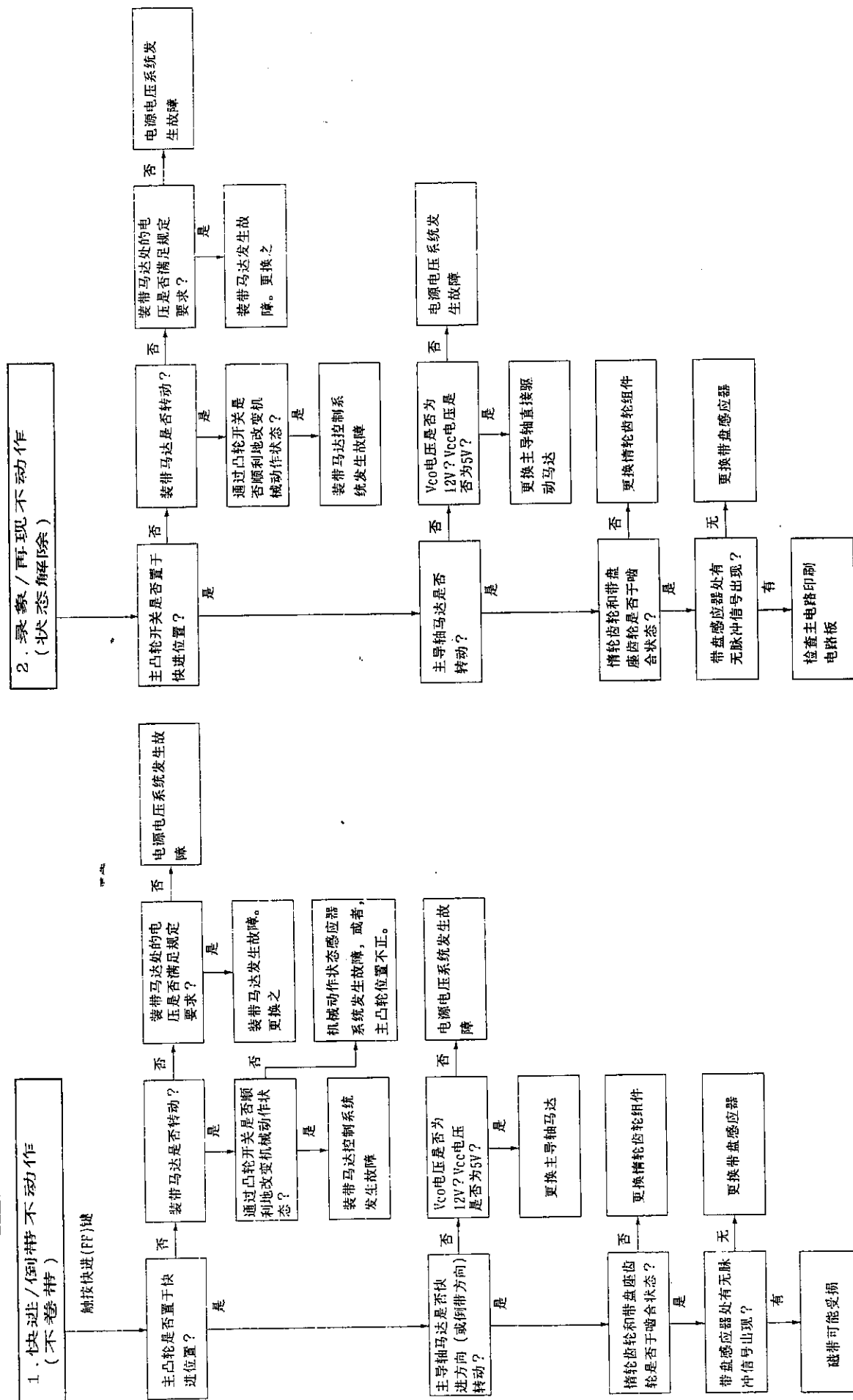
停止状态→出盒



录象/再现→停止状态

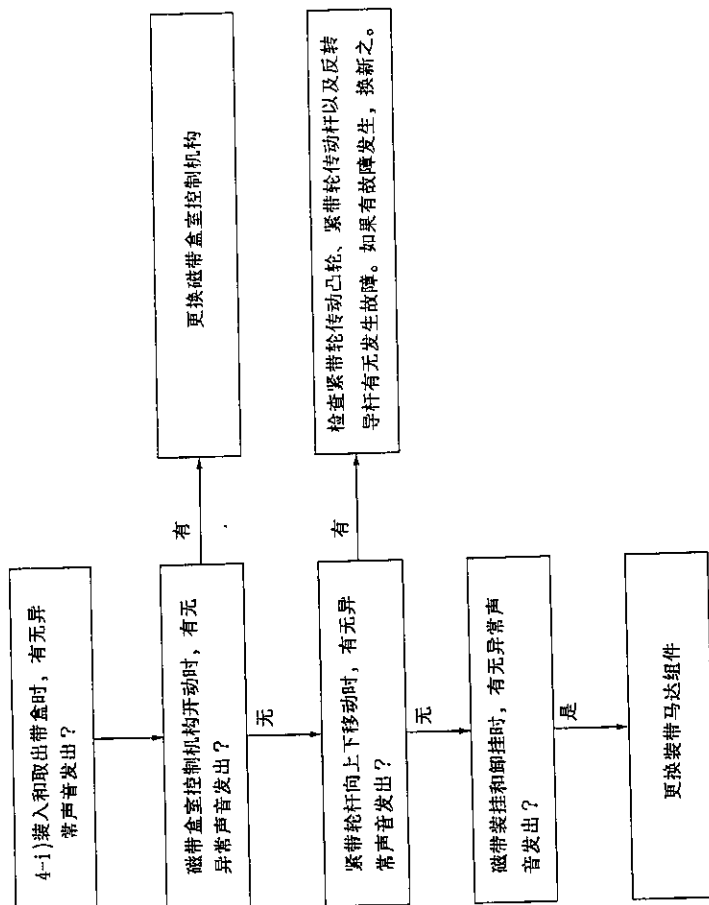


## 机械故障排查参考

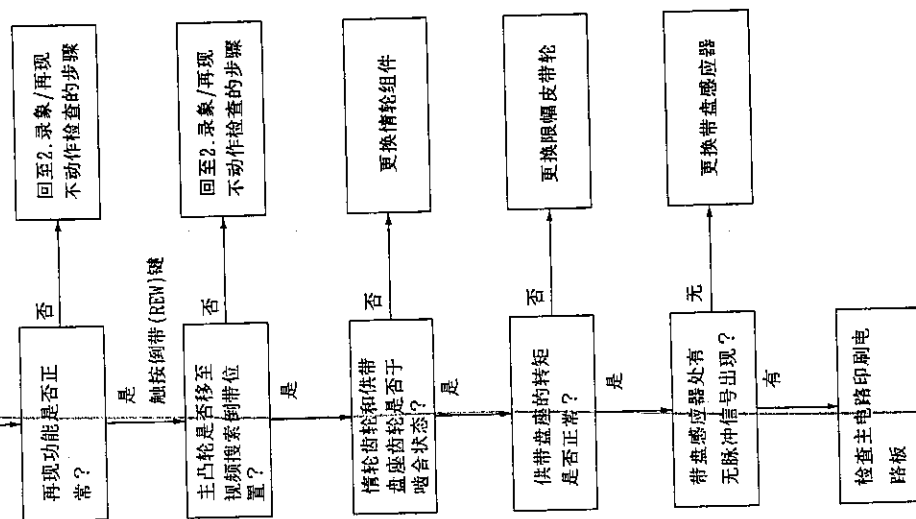


4-ji)在快进/倒带状态时发出异常声音

#### 4. 于各工作状态均发出异常声音



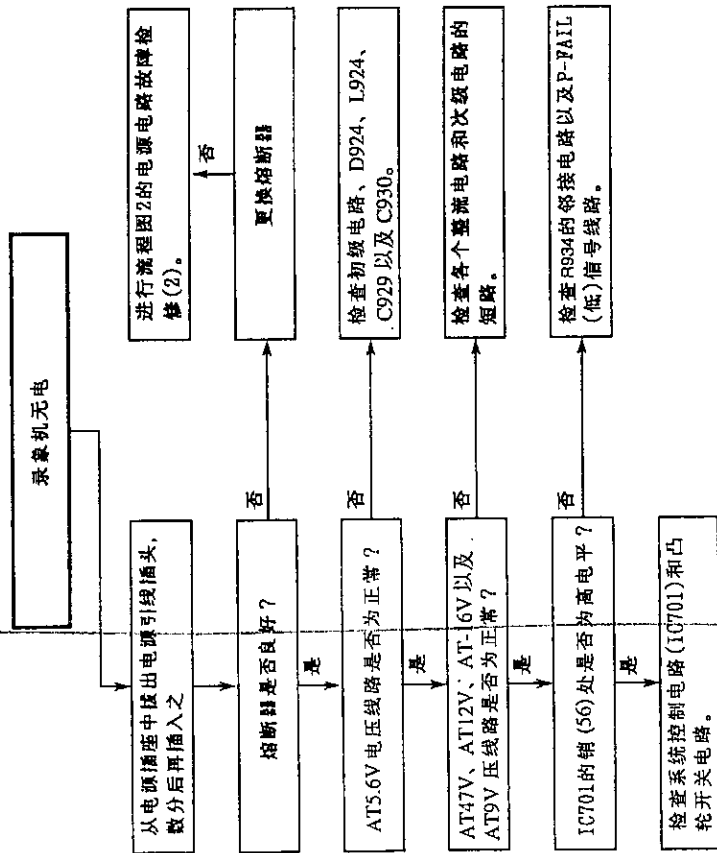
#### 3. 视频搜索倒带不动作 (不卷带)



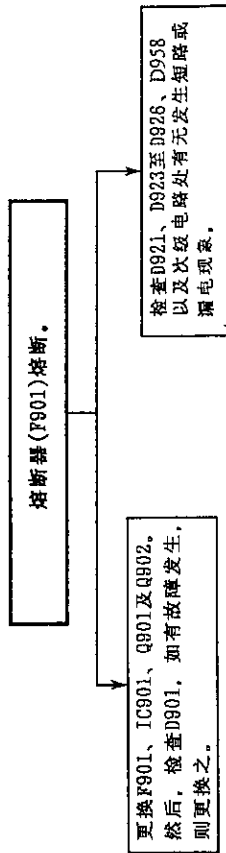


# 7 故障检修表

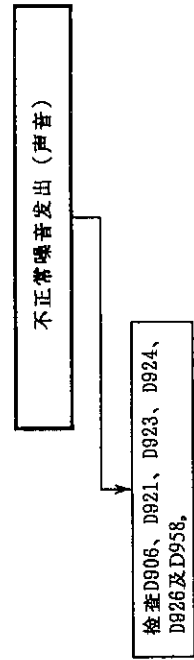
流程图 1 电源电路的故障检修 (1)



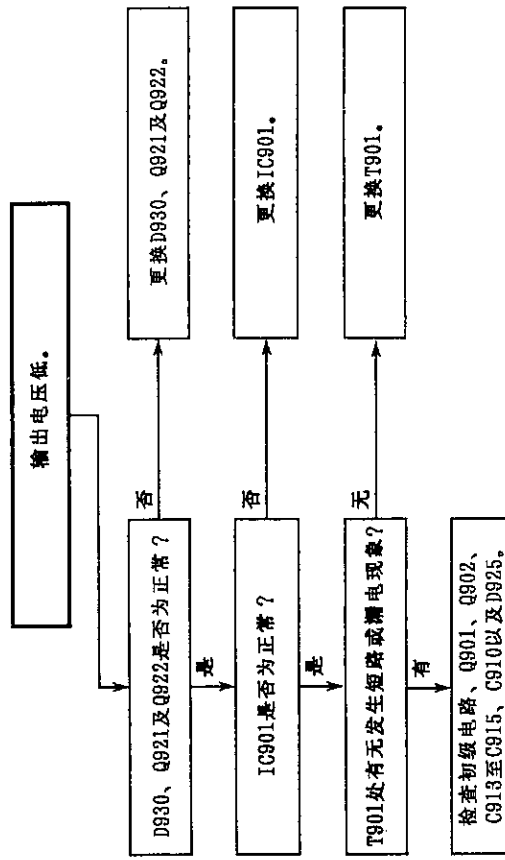
流程图 2 电源电路的故障检修 (2)



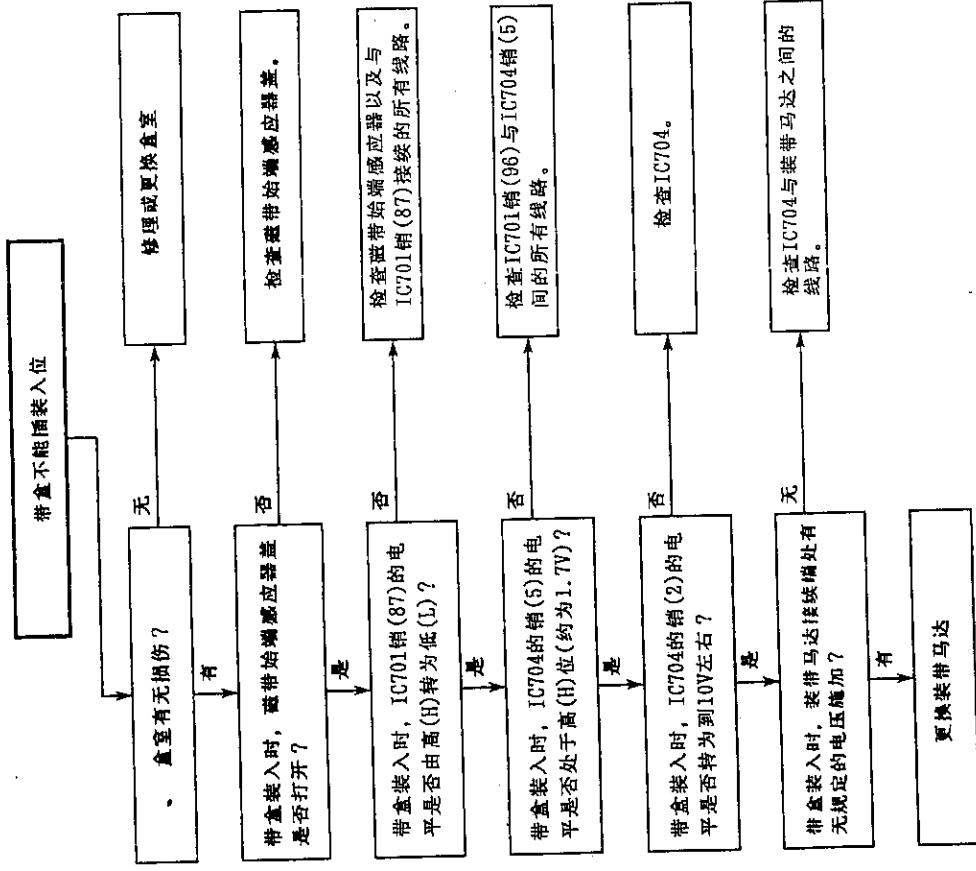
流程图 3 电源电路的故障检修 (3)



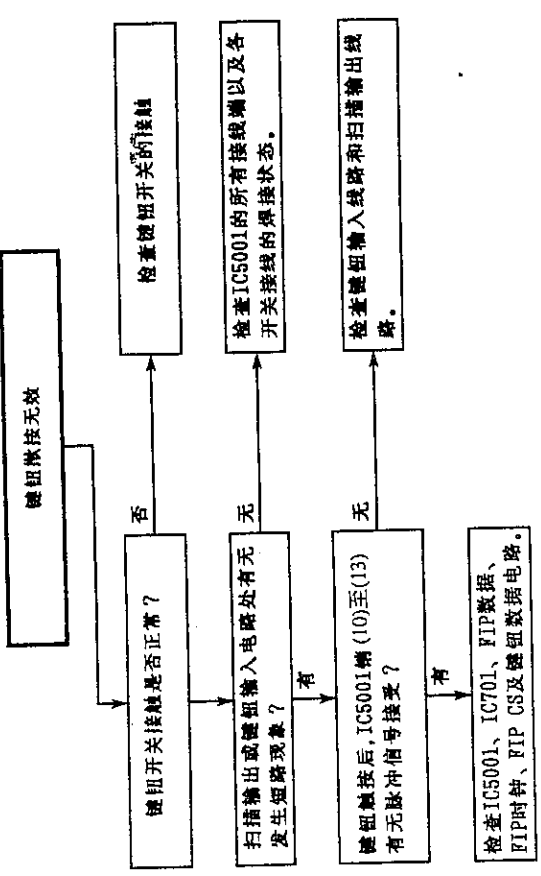
流程图 4 电源电路的故障检修 (4)



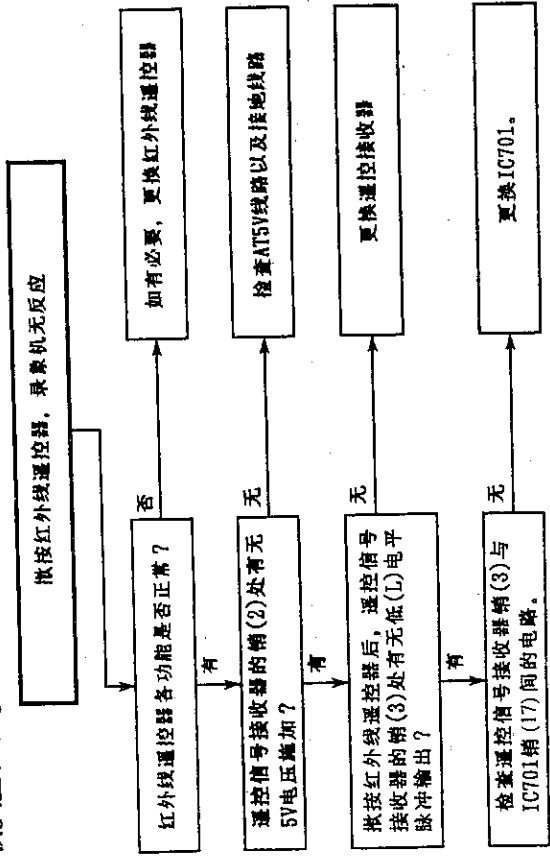
流程图 7 磁带盒室控制机构的故障检查(1)



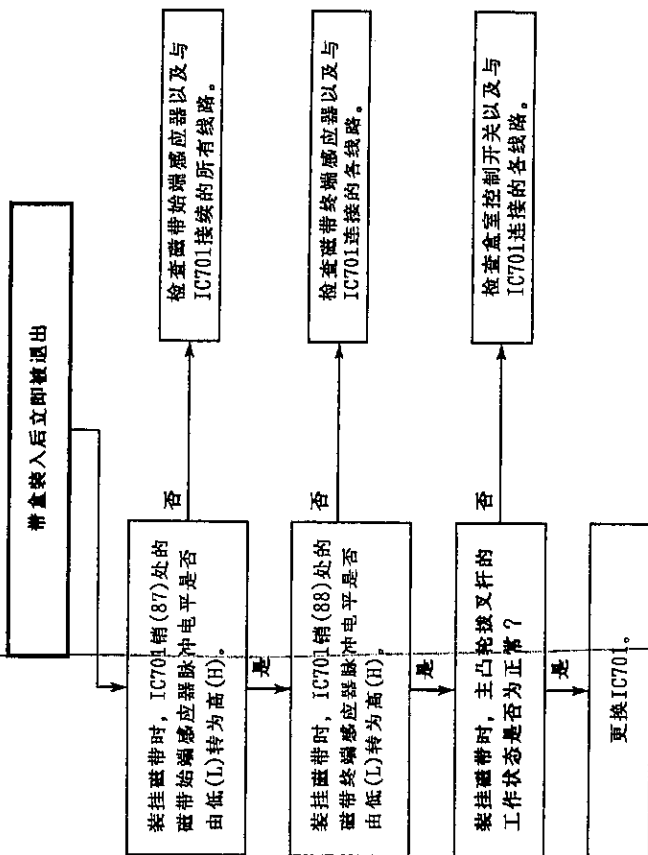
流程图 5 定时器的故障检查



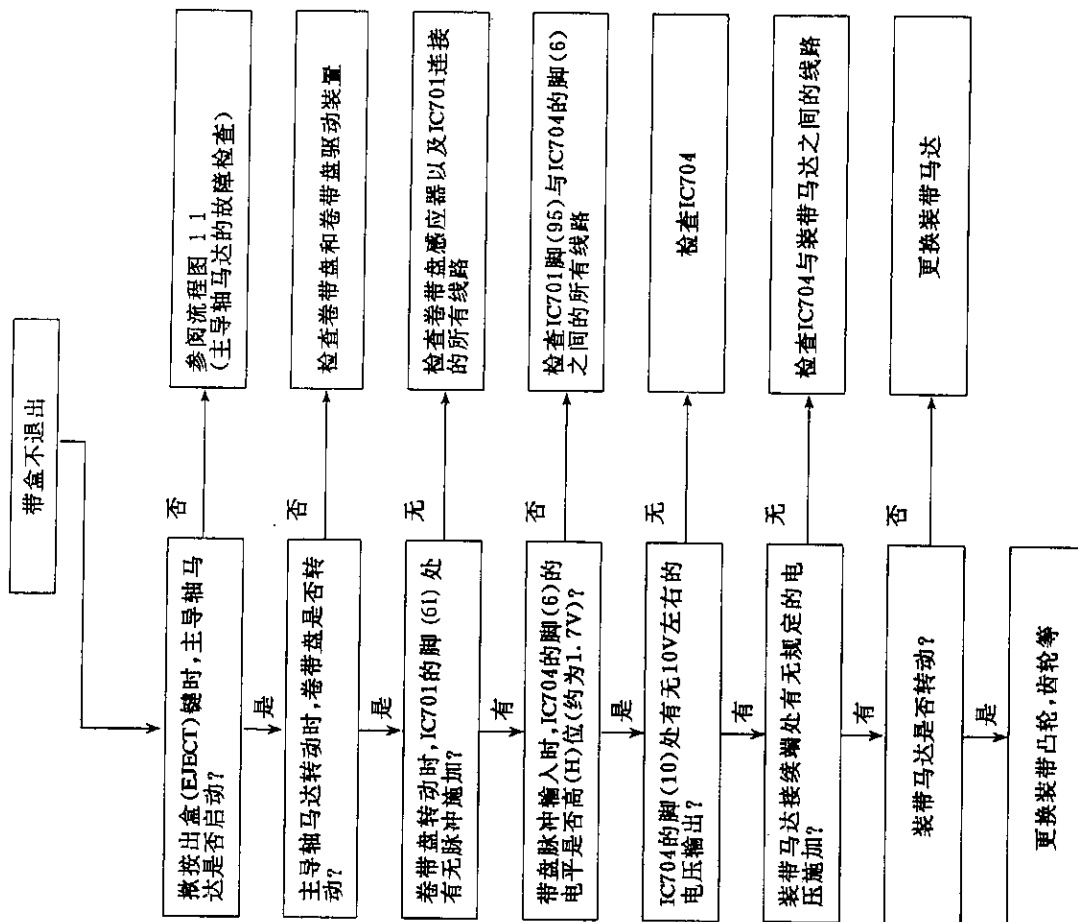
流程图 6 红外线遥控器的故障检查



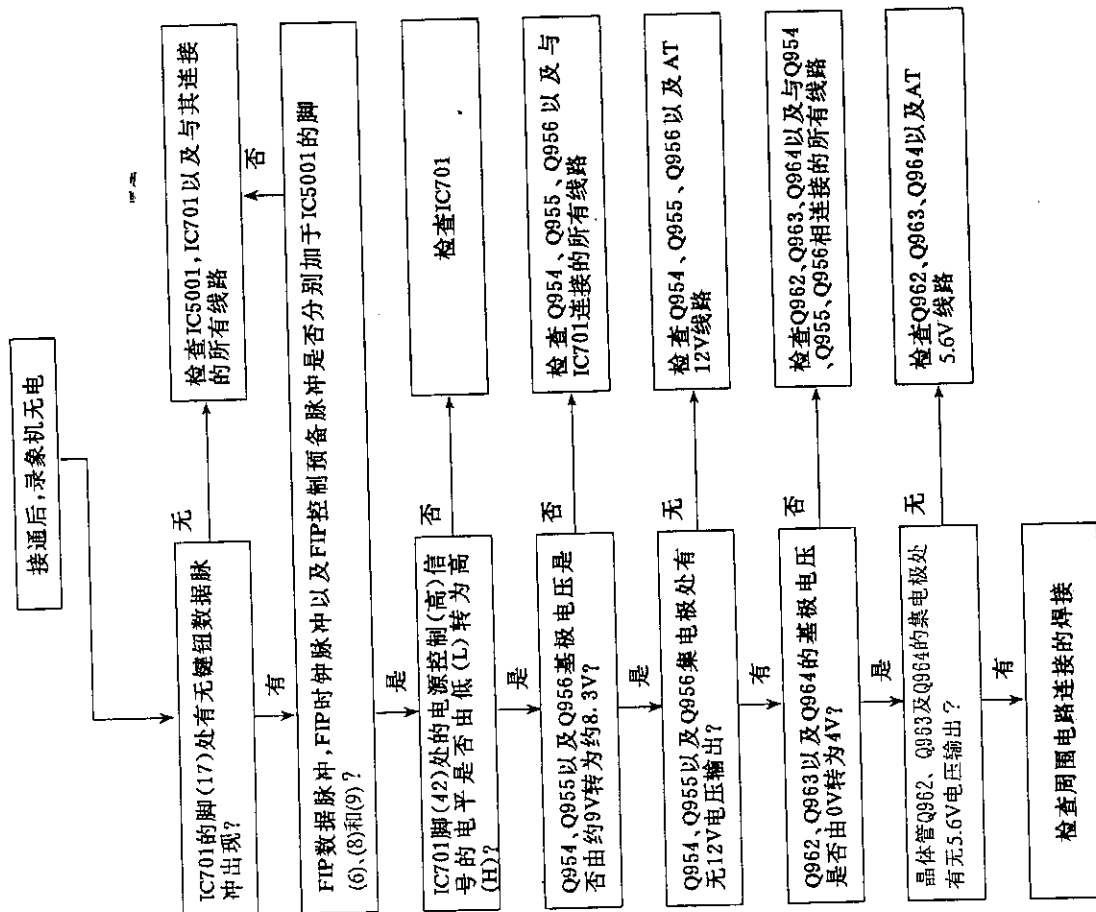
流程图 8 磁带盒控制机构的故障检查(2)



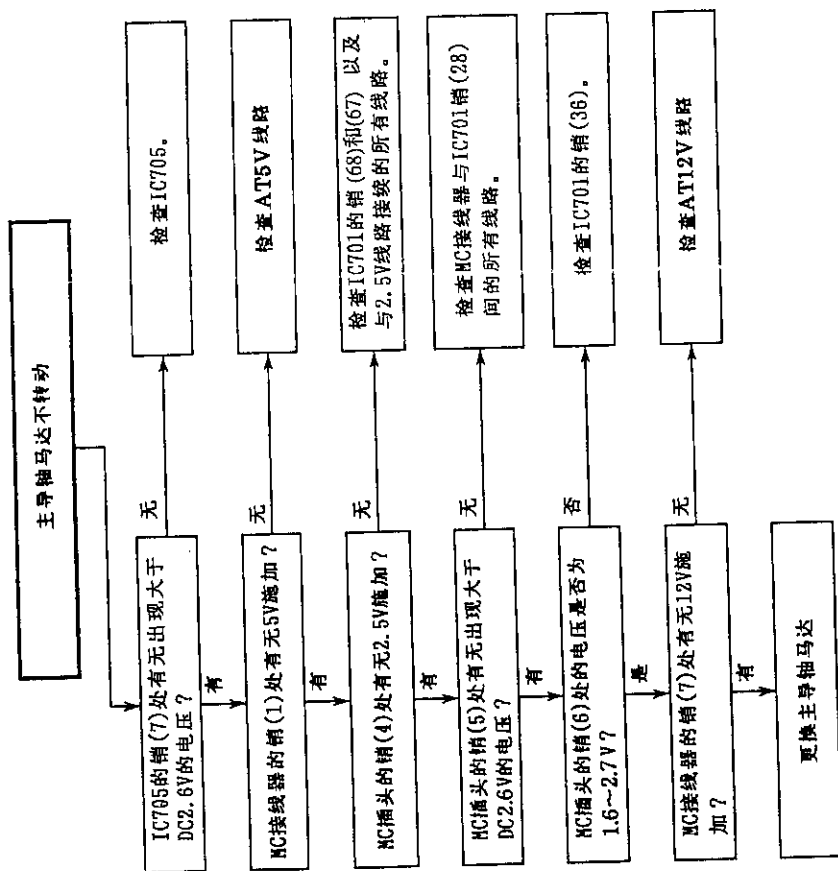
流程图 9 装带马达以及出盒动作的故障检查



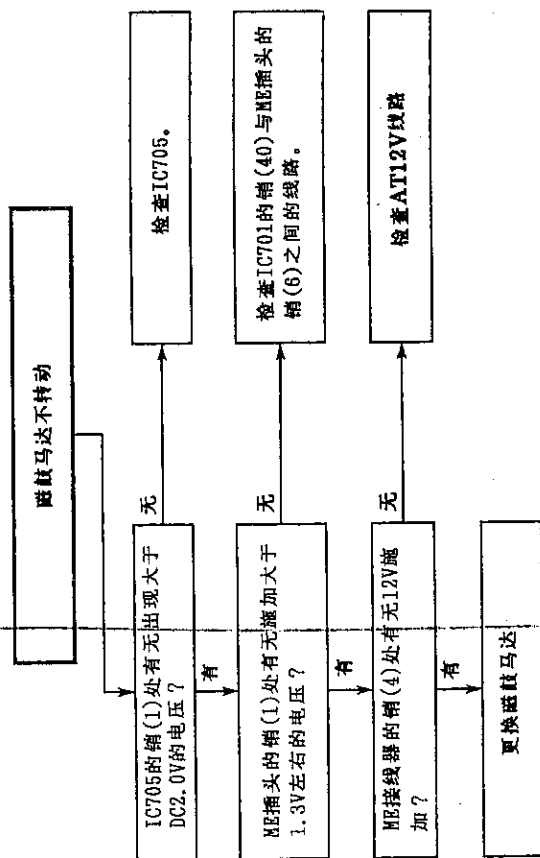
流程图10 系统控制电路的故障检查



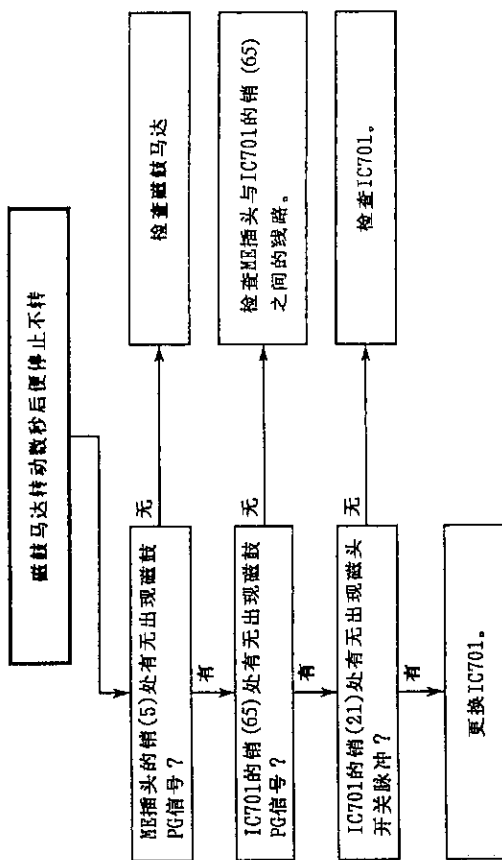
流程图11 主导轴马达的故障检查



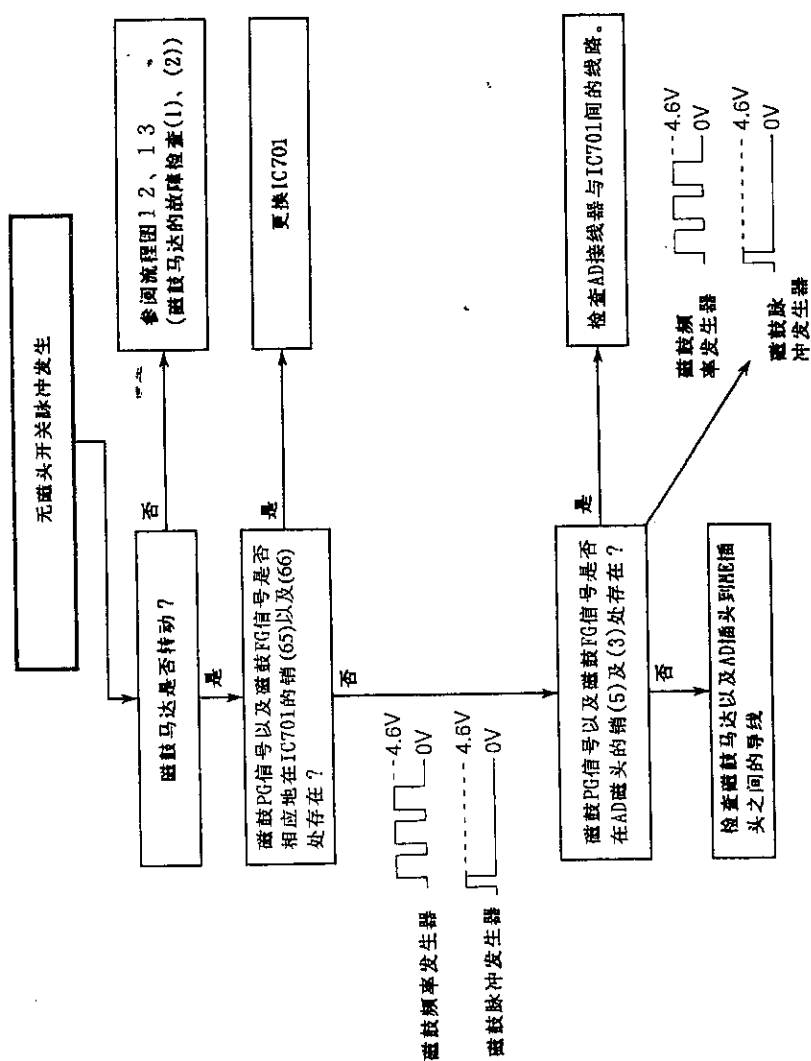
流程图 12 磁鼓马达的故障检查(1)



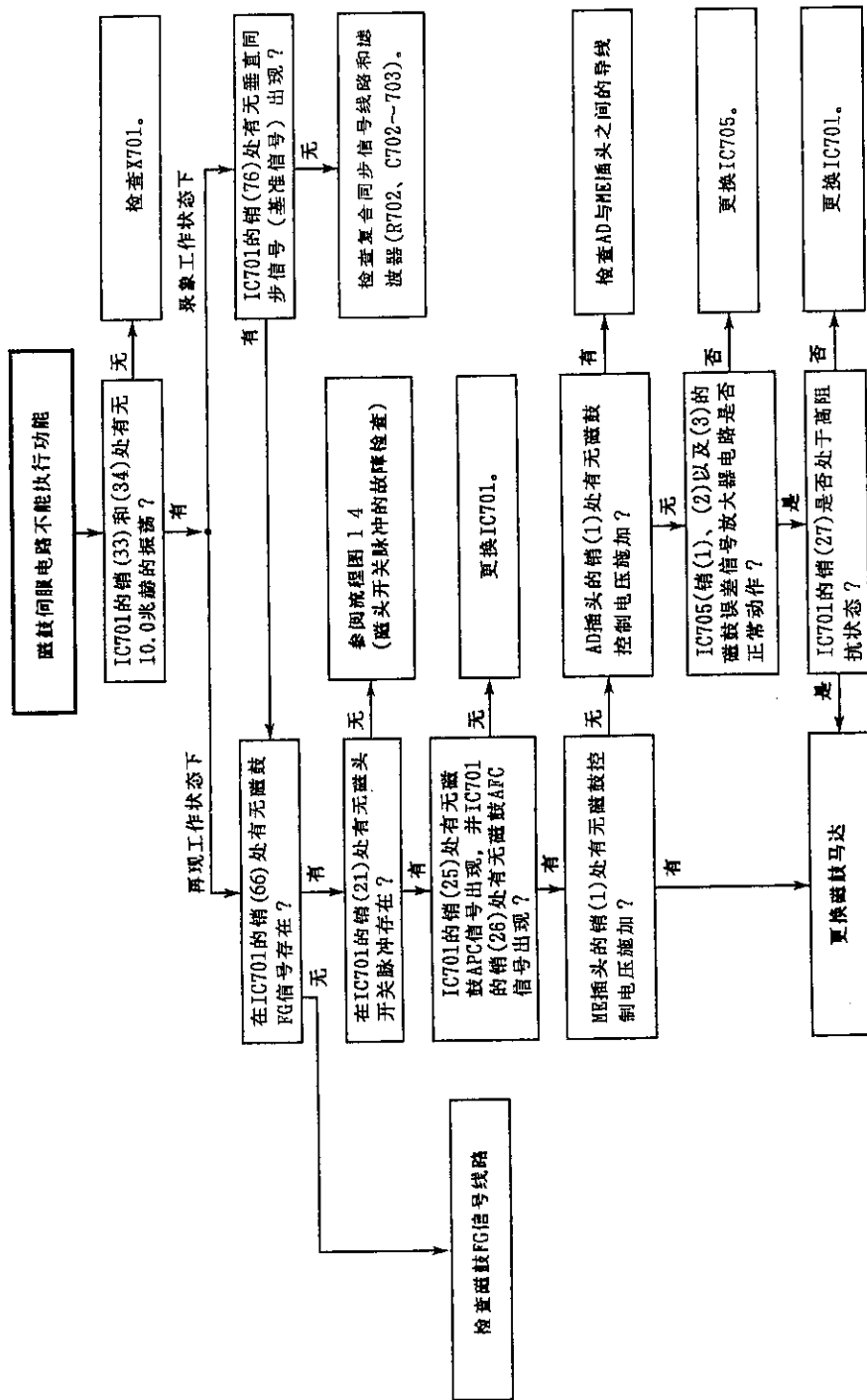
流程图 13 磁鼓马达的故障检查(2)



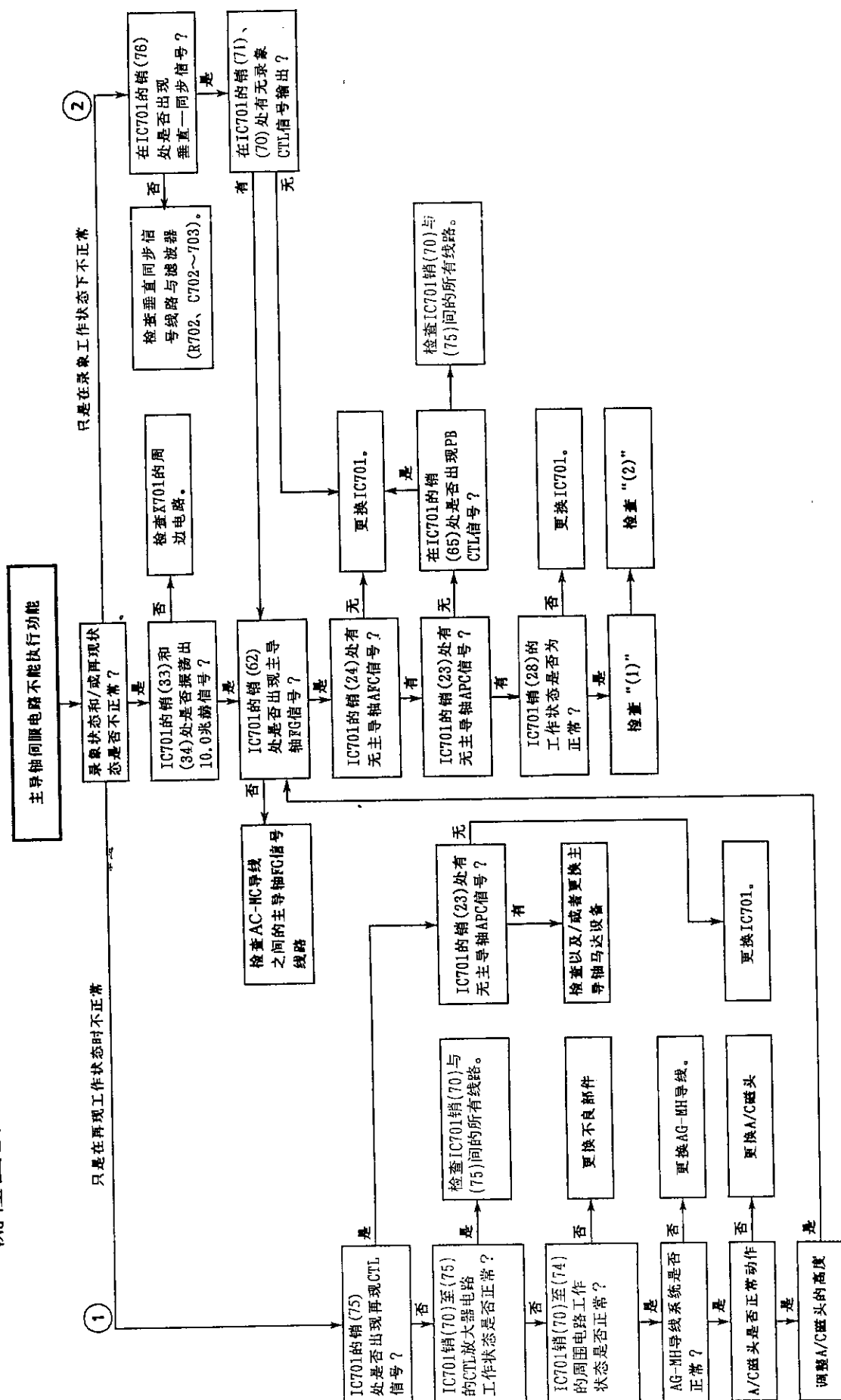
流程图 14 磁头开关脉冲的故障检查



流程 图 15 磁鼓伺服电路的故障检查

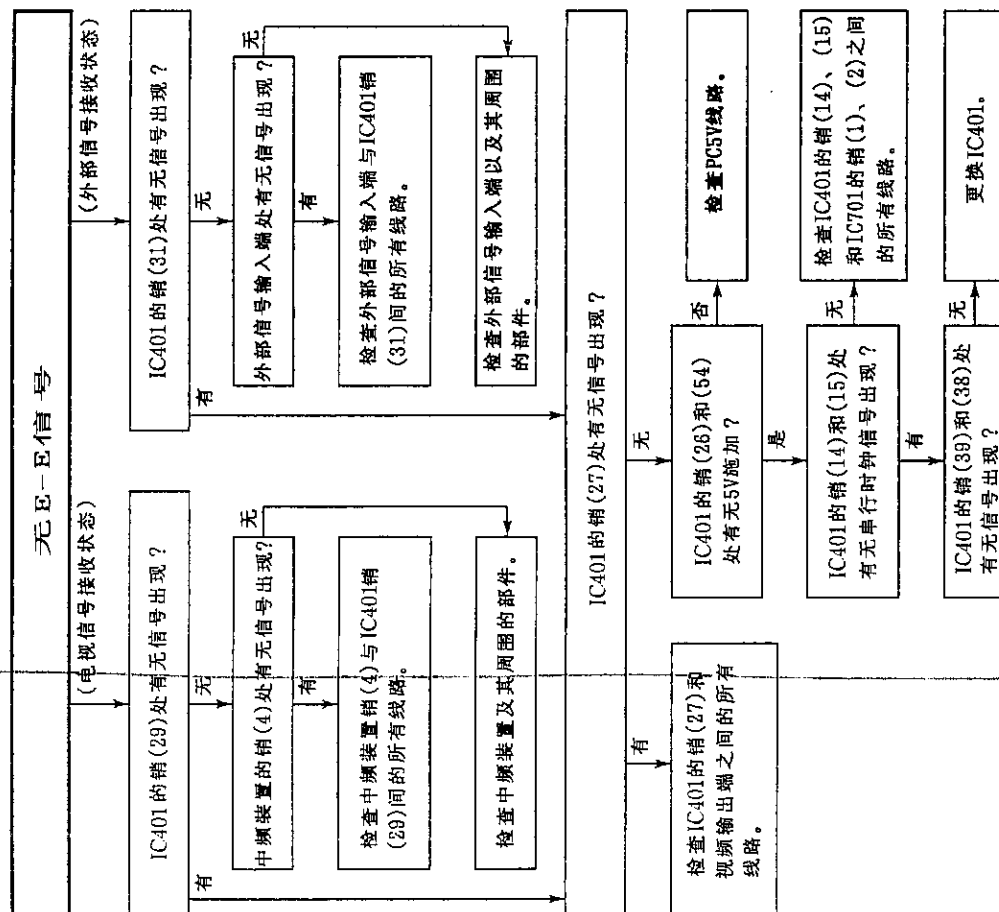


流程图 16 主导轴伺服电路的故障检查

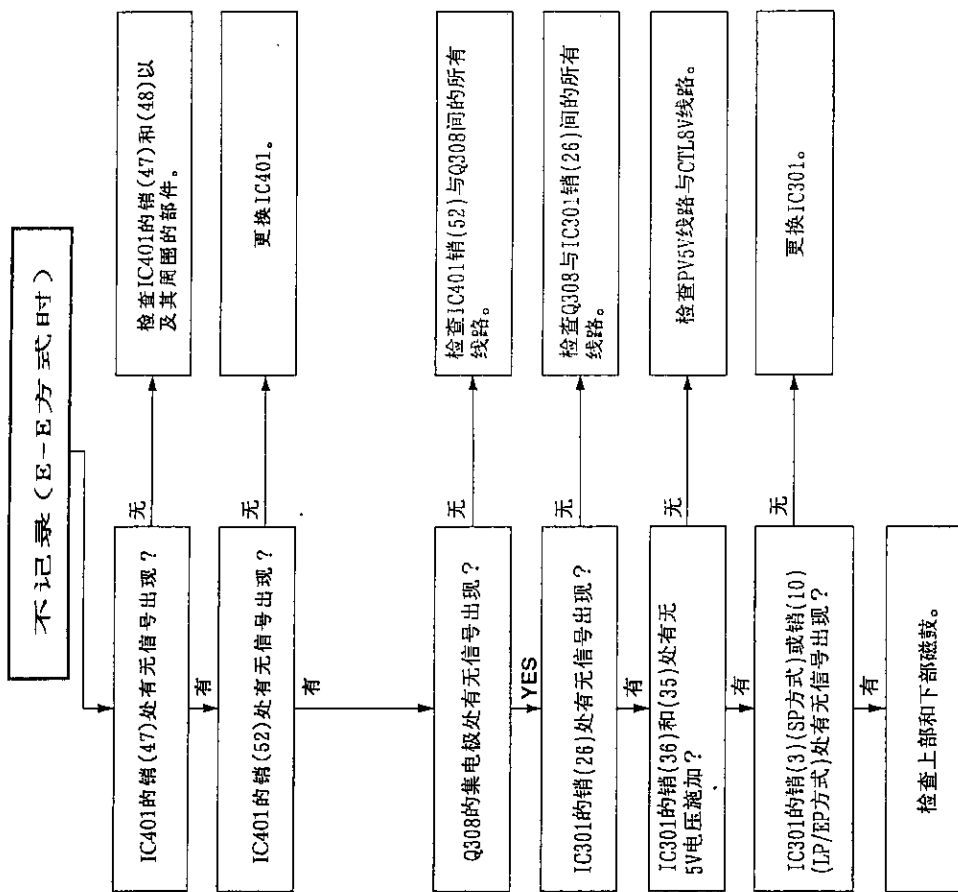




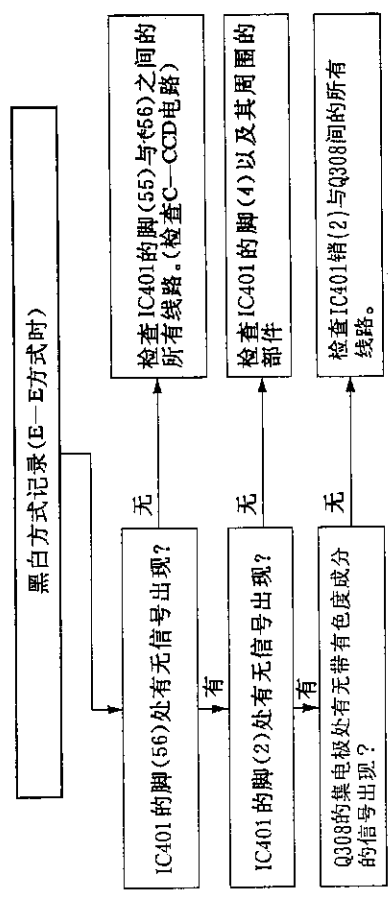
流程图 17 E-E方式的故障检查



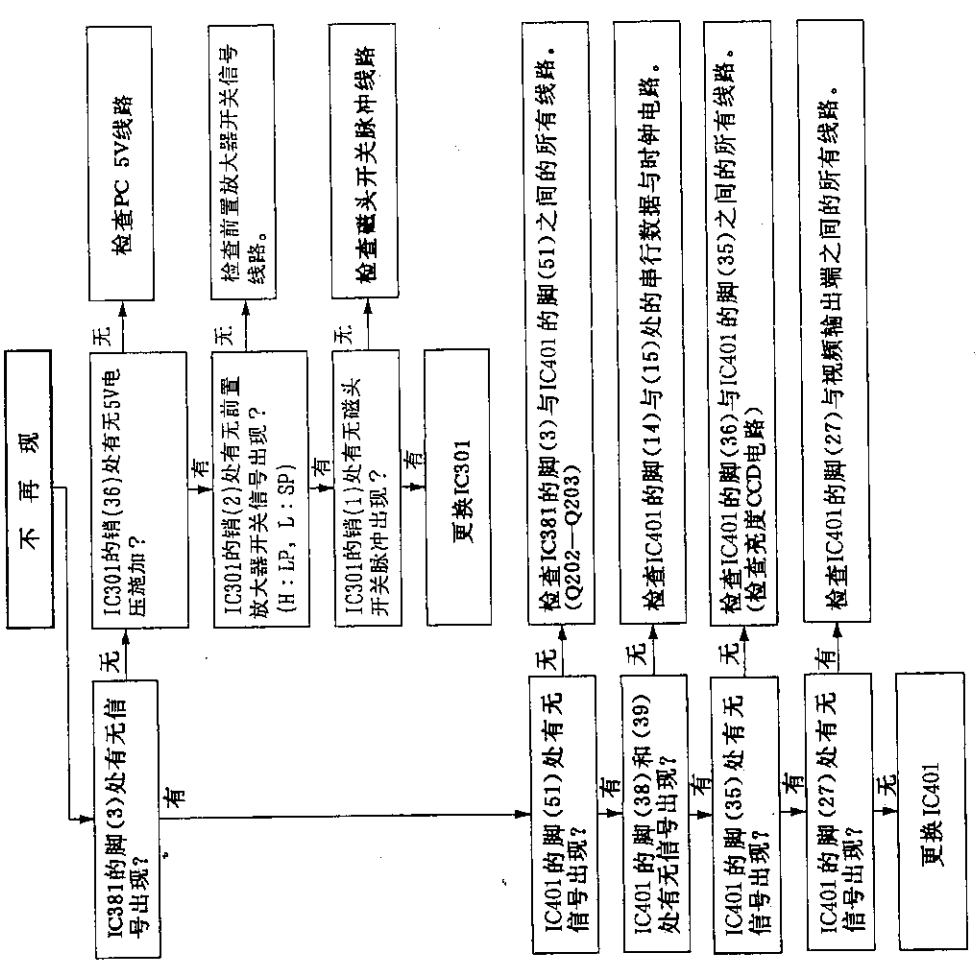
流程图 18 记录状态(亮度)的故障检查



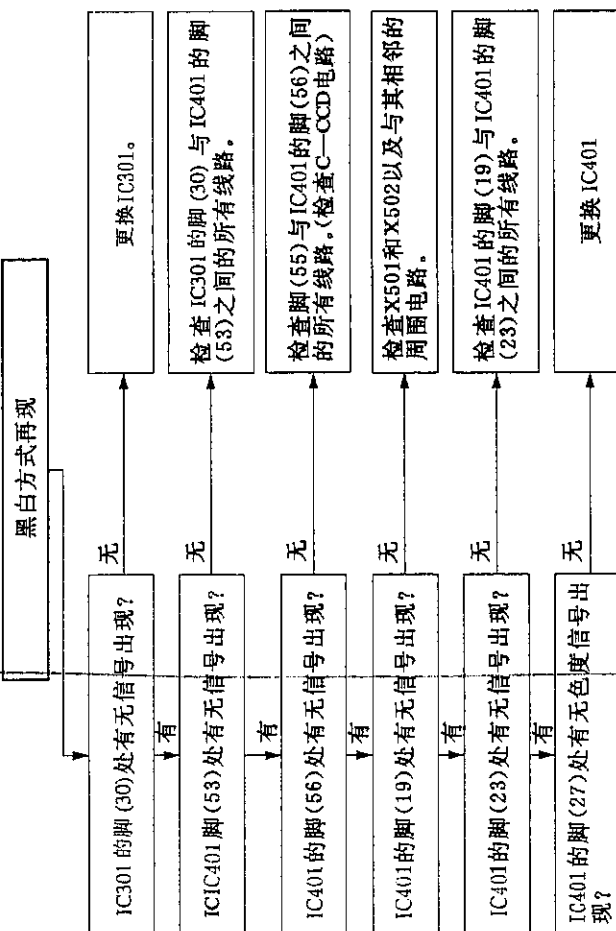
流程图19 录音状态(色度)的故障检查



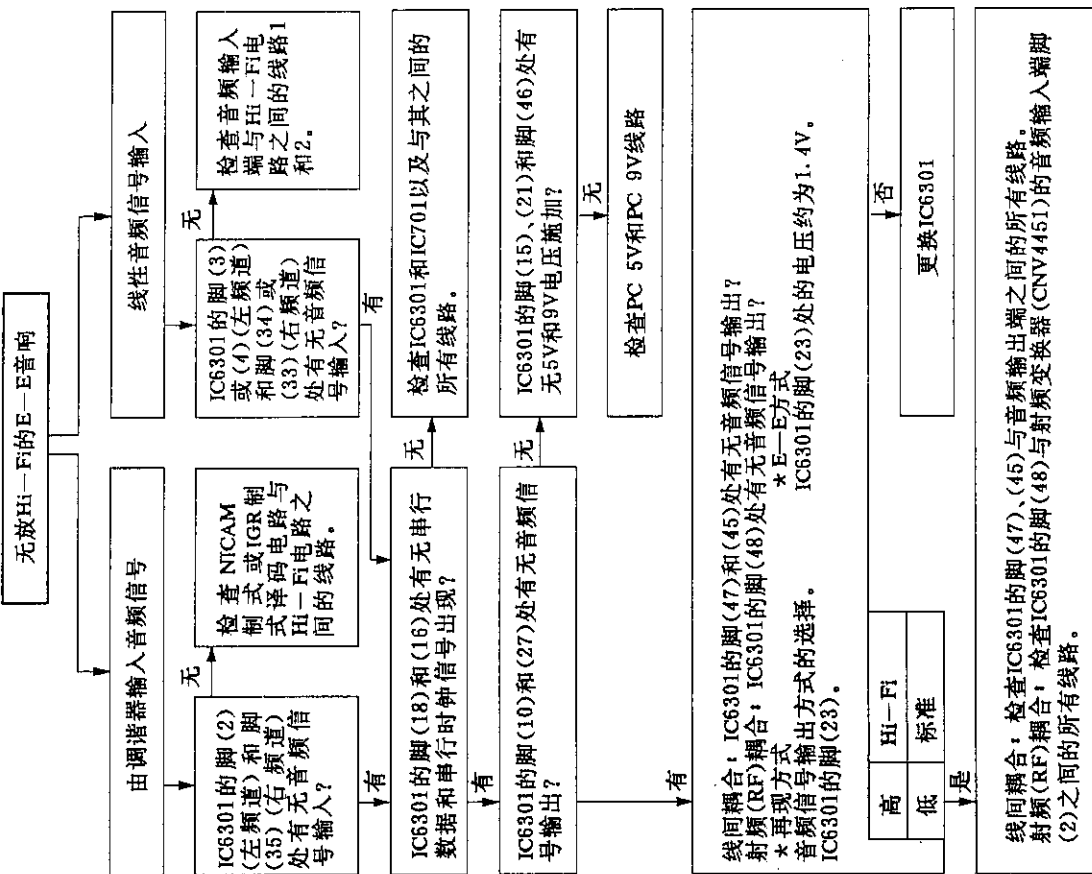
流程图20 再现状态(亮度)的故障检查



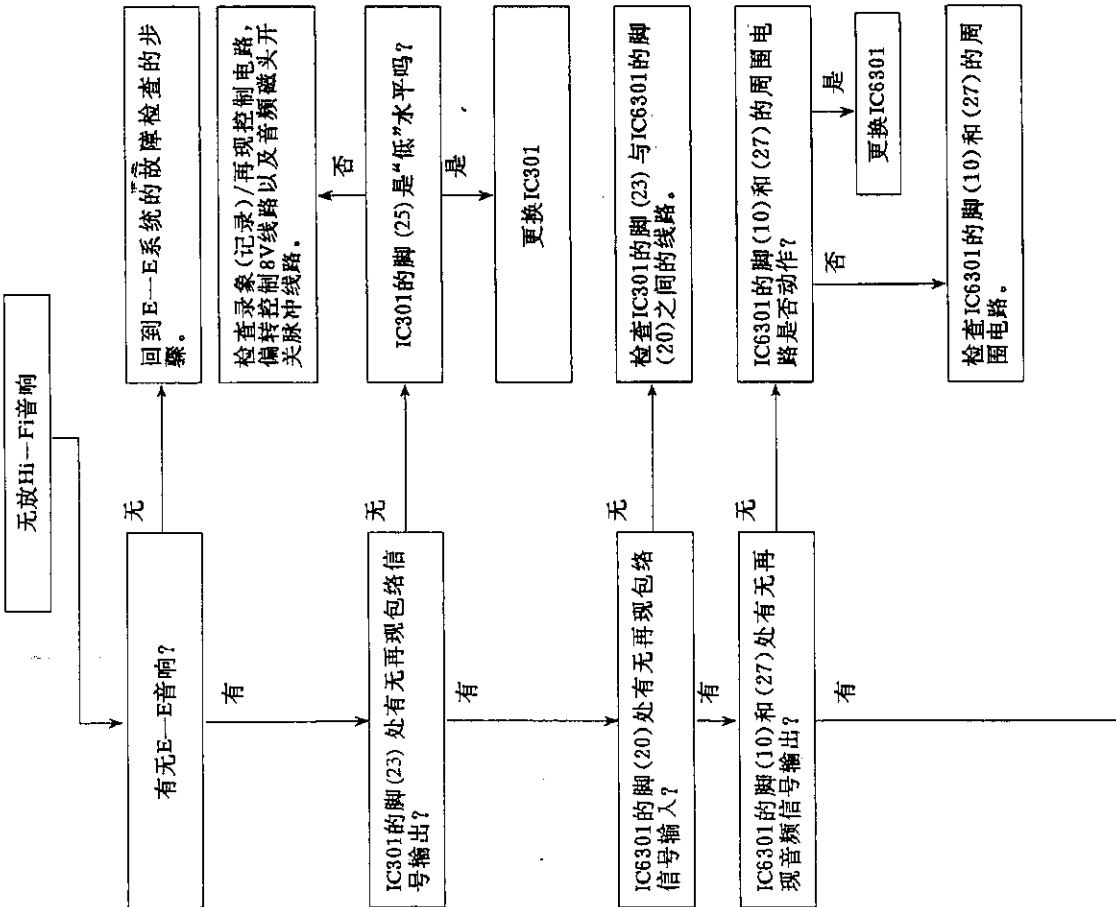
流程图21 再现状态(色度)的故障检查



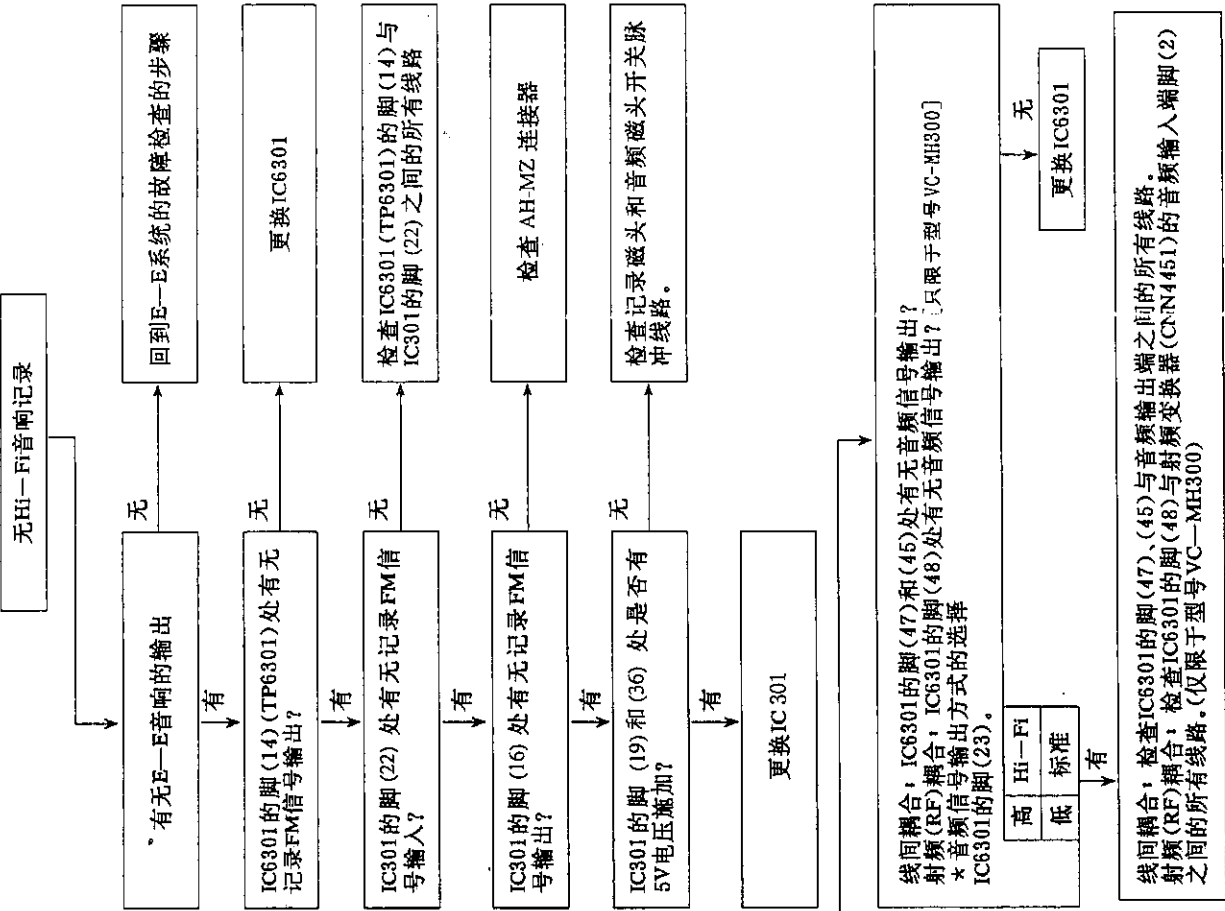
流程图22 Hi-FI电路的故障检查(1)



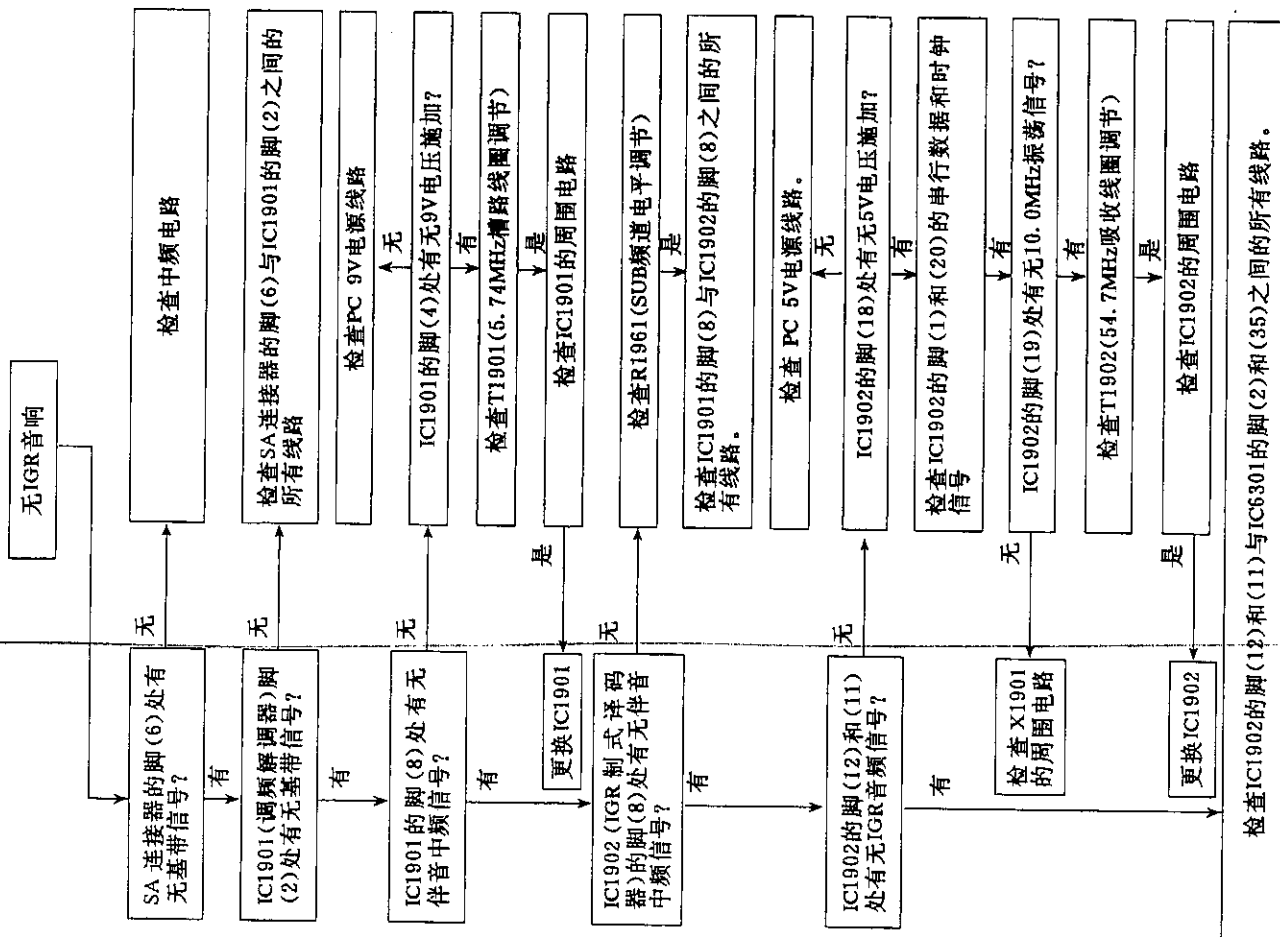
流程图23 Hi-Fi电路的故障检查(2)



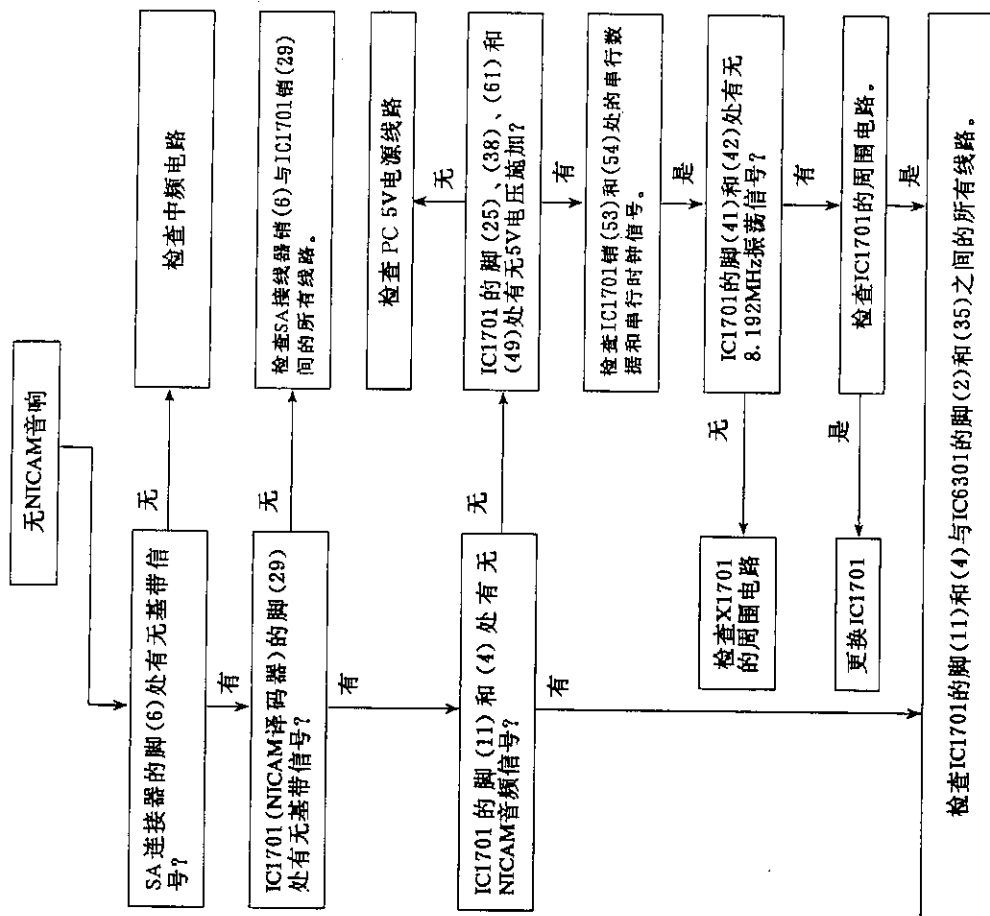
流程图24 Hi-Fi电路的故障检查(3)



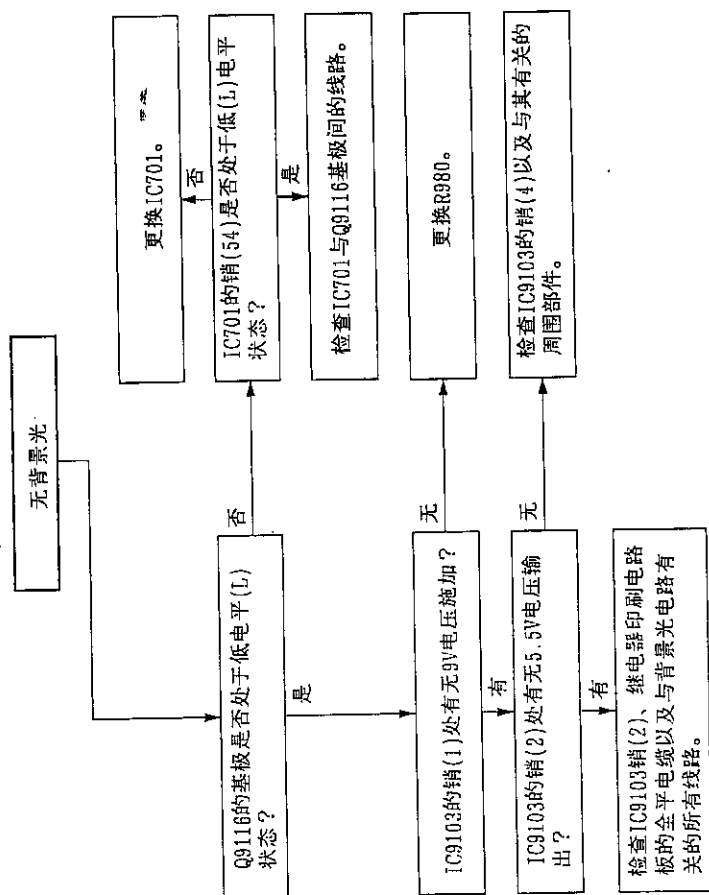
流程图25 IGR的故障检查



流程图26 NICAM的故障检查

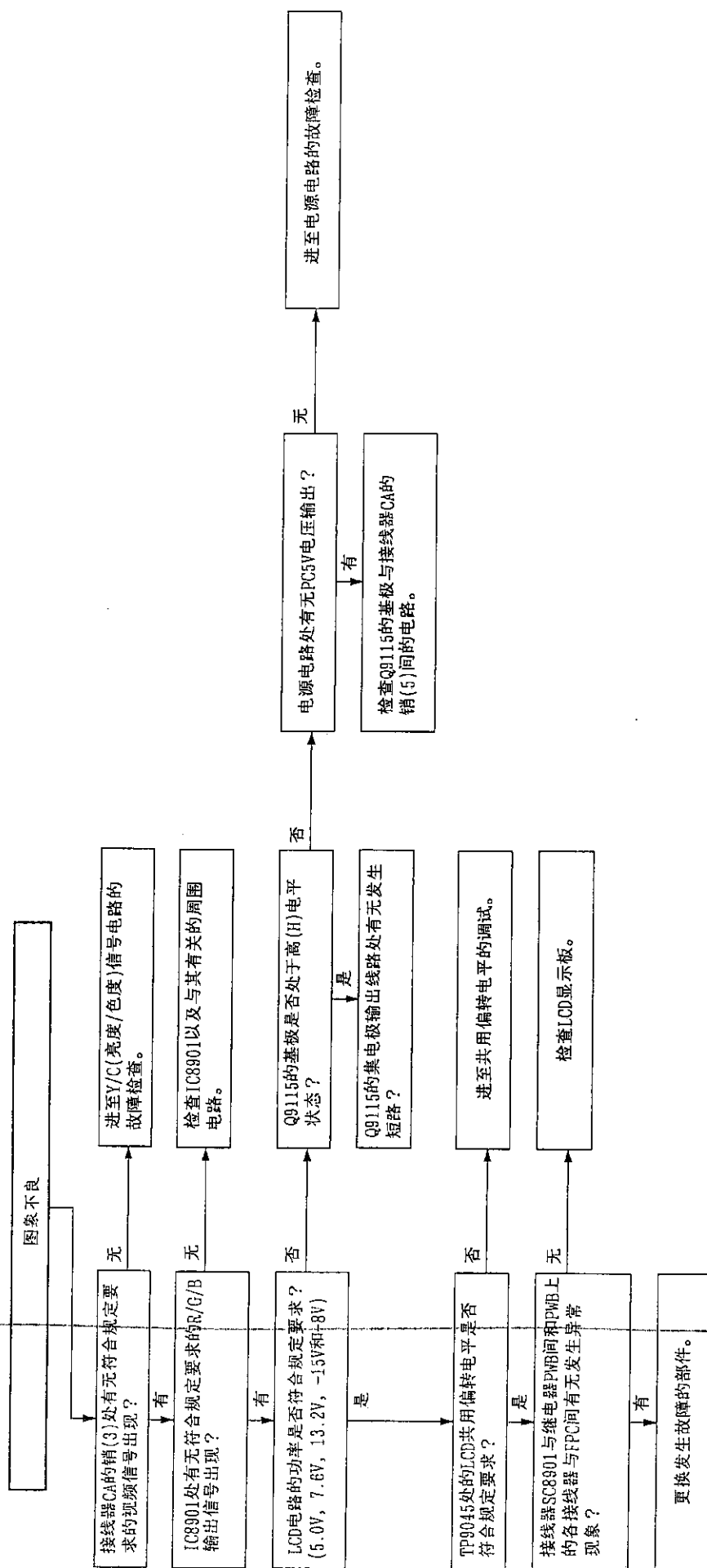


流程图27. LCD (液晶显示器) 的故障检查 (1)

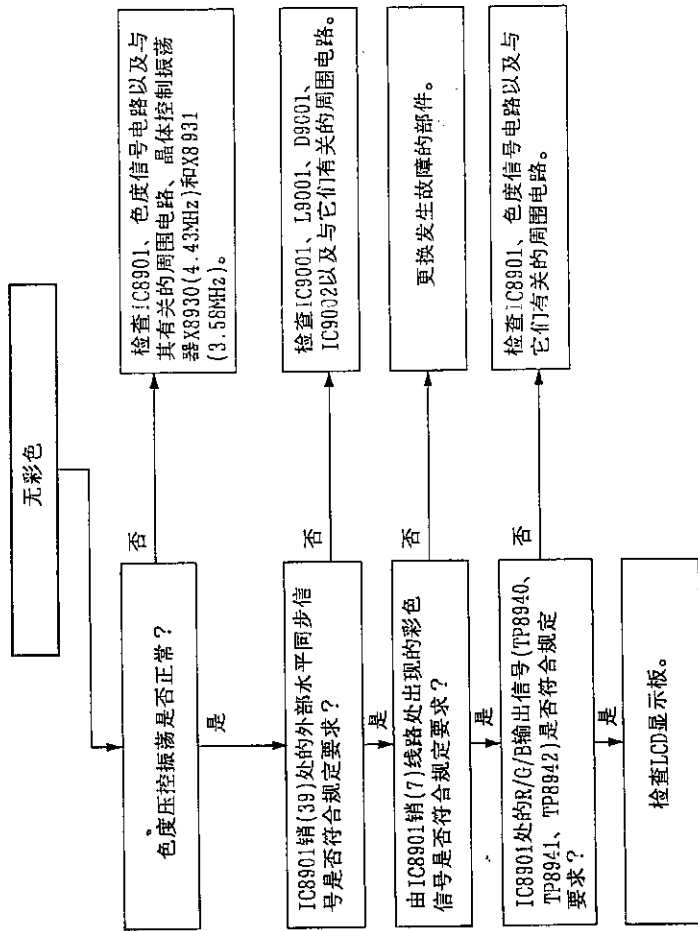


背景光电压	启动时的5秒钟	标准
	约7.6V	约5.4V

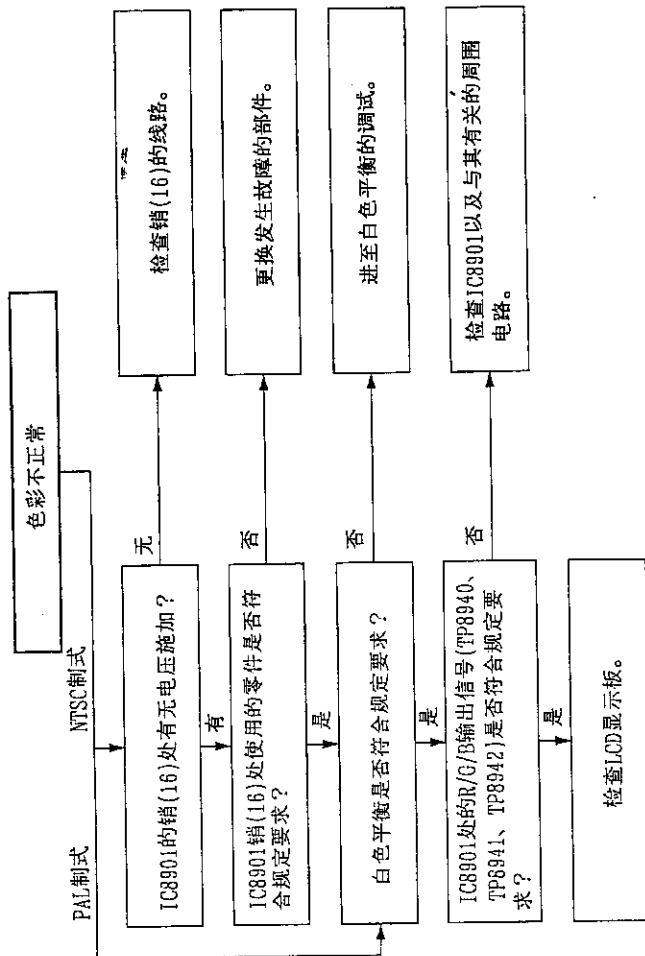
流程图28. LCD(液晶显示器)的故障检查(2)



163  
流程图30. LCD(液晶显示器)的故障检查(4)



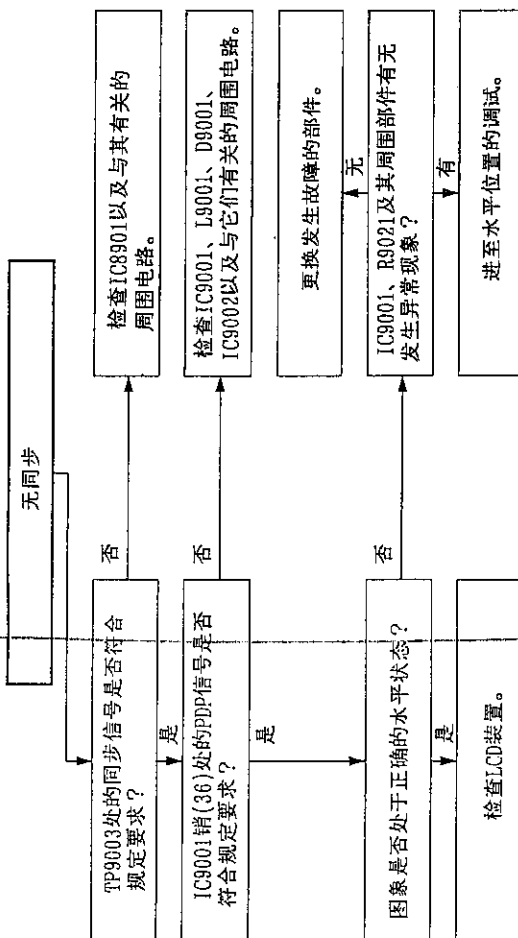
流程图29. LCD(液晶显示器)的故障检查



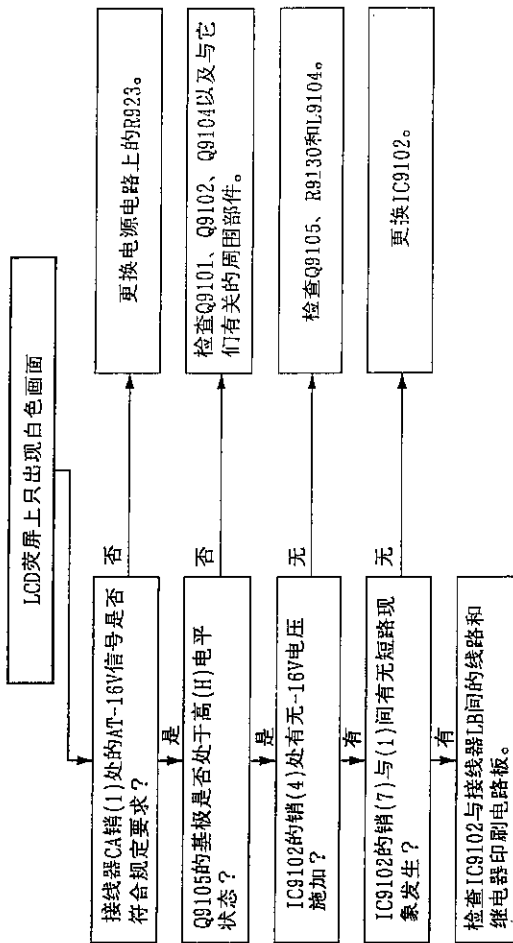
注意：只使用PAL和NTSC3.58制式时，在液晶显示板荧屏上会出现色彩。在使用SECAM制式、NTSC4.43制式及NTSC制式的NT→PAL电视状态下不会出现色彩。



流程图31. LCD(液晶显示器)的故障检查(5)



流程图32. LCD(液晶显示器)的故障检查(6)



## IC703 (EEPROM) 的更换

### 《更换时的注意事项》

IC703(EEPROM)经更换后,必须重新编写设定其记忆数据。

1. 设录象机的电源开关于切断状态。(电源开关处于备用状态)
2. 瞬间短接工作电路印刷电路板上的TP5001与TP5002之间。检查REC LED与定时器LED便点亮,以便进入调试状态,并在液晶显示器荧屏上显示出跨接销的编号(JP-0)。
3. 触按频道上移(+)或下移(-)键,连续输入EEPROM地址码上的JP0至JP-31的功能编号(显示在液晶显示器荧屏上)。触按DISPLAY(显示)键以启动选定的功能,或者,触按CLEAR(取消)键以取消其功能。
  - \* 触按DISPLAY(显示)键,便启记忆功能,REC LED和定时器LED会熄灭。
  - \* 触按CLEAR(取消)键,便停止记忆功能,REC LED和定时器LED会点亮。
4. 继续输入JP-1至JP-31的功能编号。最后,再次瞬间短接测试点TP5001与TP5002之间,取消调试状态设定,使录象机返回至标准状态(时钟显示状态)。

	序 号	功 能	ML3/ML3W/NL3	MH330			
定 时 器	JP0	COROUR 0	0	0			
	1	COROUR 1	0	0			
	2	VPS PDC	0	0			
	3	SPATIALIZER	0	1			
	4	VCR 0	0	0			
	5	VCR 1	0	0			
	6	SYSTEM 0	1	1			
	7	SYSTEM 1	1	1			
	8	R/C CODE	0	1			
	9	P-IN-P	0	0			
	10	LCD	1	0			
	11	———	0	0			
	12	DUAL SCART	1	1			
	13	FRONT A/V	0	0			
	14	LP/EP	1	1			
	15	(0: 00) OEM	1	1			
系 统 控 制 器	16	G-CODE0	1	1			
	17	G-CODE1	0	0			
	18	NICAM 0	1	1			
	19	NICAM 1	0	0			
	20	S. PICTURE	0	0			
	21	DECODER	0	0			
	22	AUTO CLOCK/SORT	0	0			
	23	Hi-Fi	1	1			
	24	HEAD0	0	1			
	25	HEAD1	1	0			
	26	NTSC SKEW	1	1			
	27	INSTANT REPLAY	1	1			
	28	———	0	0			
	29	———	0	0			
	30	———	0	0			
	31	———	0	0			

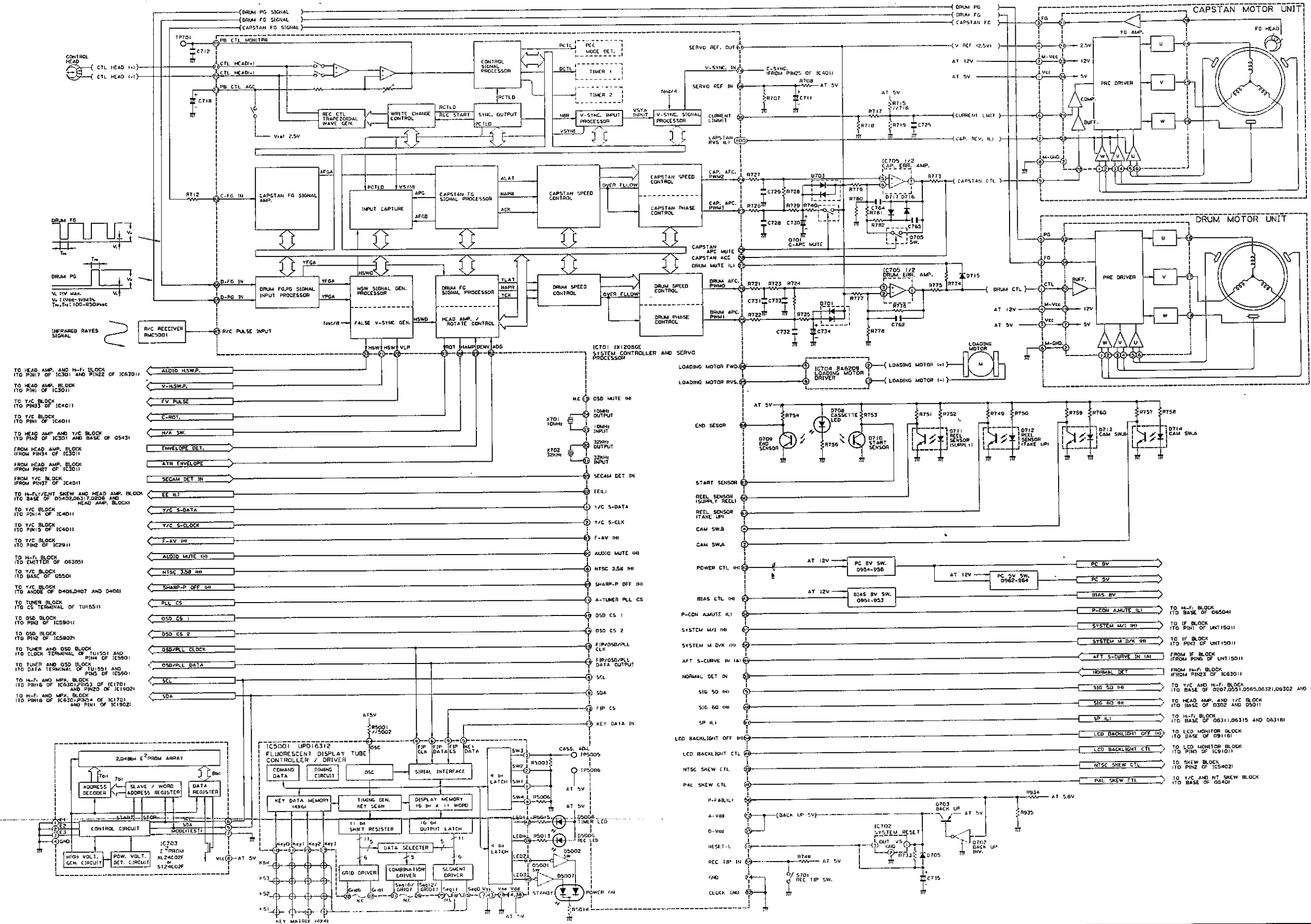
(注意：“1”意为；录象用发光二极管(REC LED)和定时器用发光二极管(TIMER LED)熄灭，  
“0”意为；录象用发光二极管(REC LED)和定时器用发光二极管(TIMER LED)点亮)

# 8. BLOCK DIAGRAM 方框图

## SERVO PROCESS/SYSTEM CONTROL BLOCK DIAGRAM 伺服处理/系统控制电路方框图

VC-ML3  
VC-ML3W

VC-ML3  
VC-ML3W



# SIGNAL FLOW BLOCK DIAGRAM 信号流程方框图

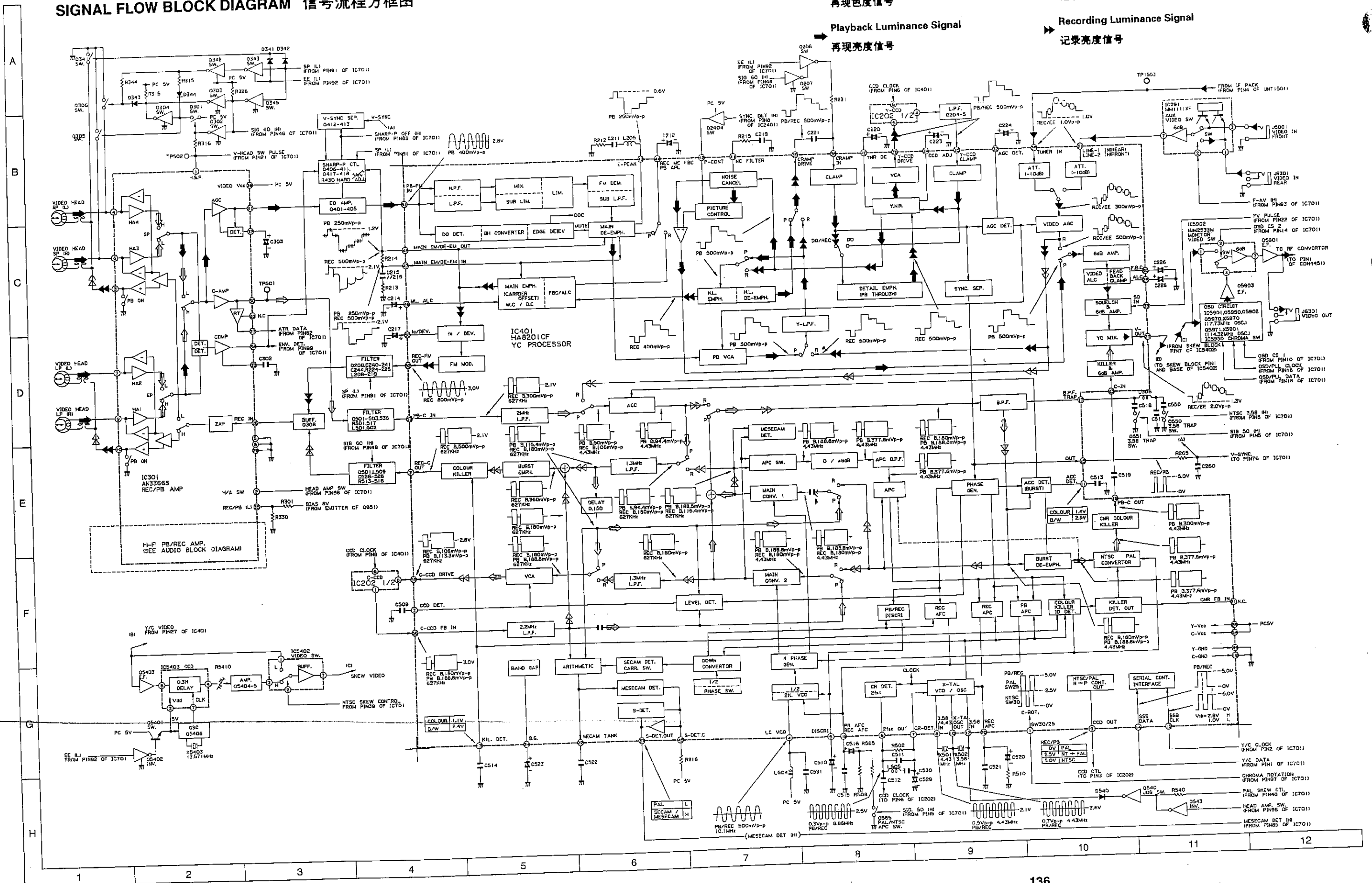
Playback Chrominance Signal  
再现色度信号

Playback Luminance Signal  
再现亮度信号

Recording Chrominance Signal  
记录色度信号

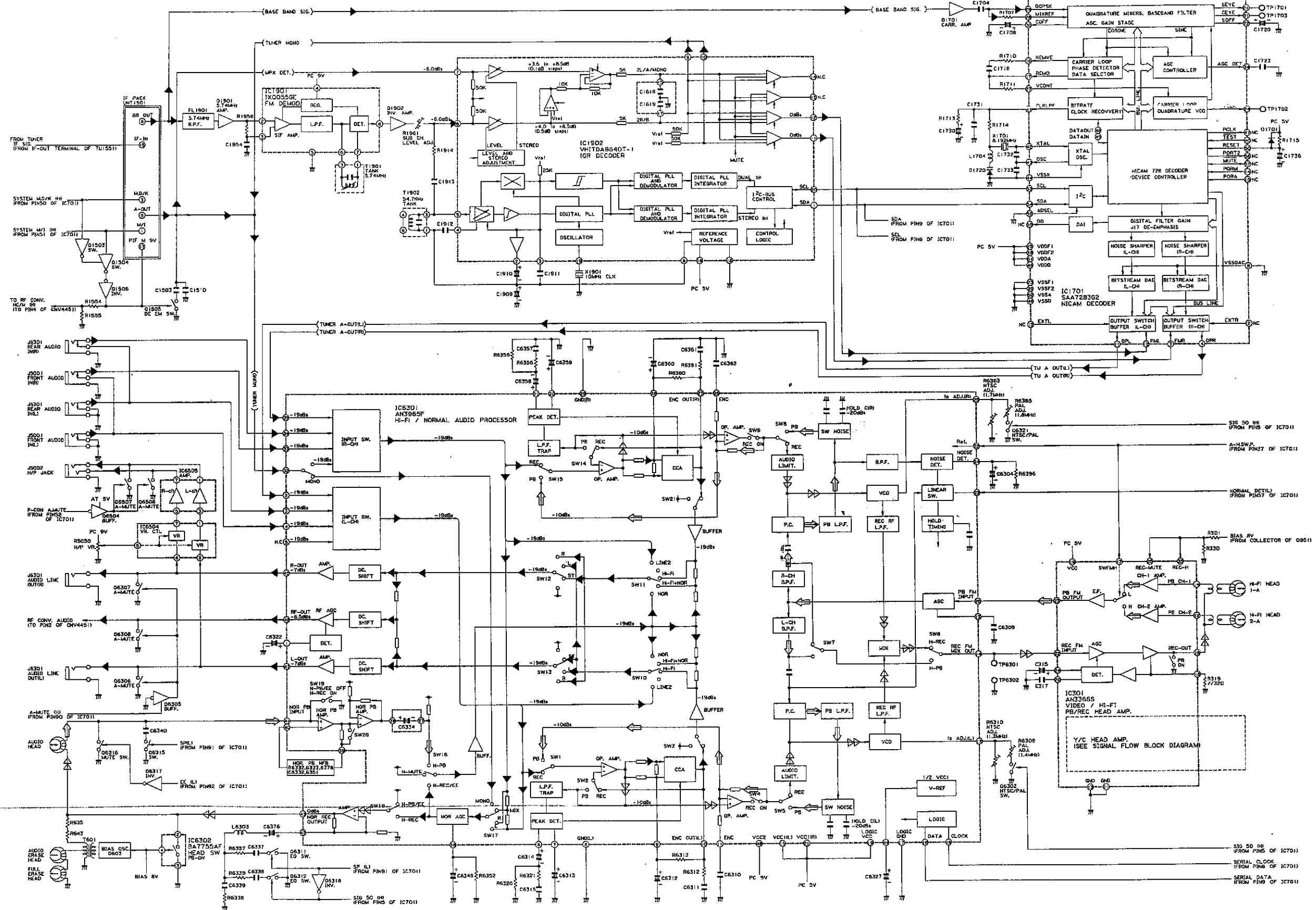
Recording Luminance Signal  
记录亮度信号

E-E Signal  
E-E信号

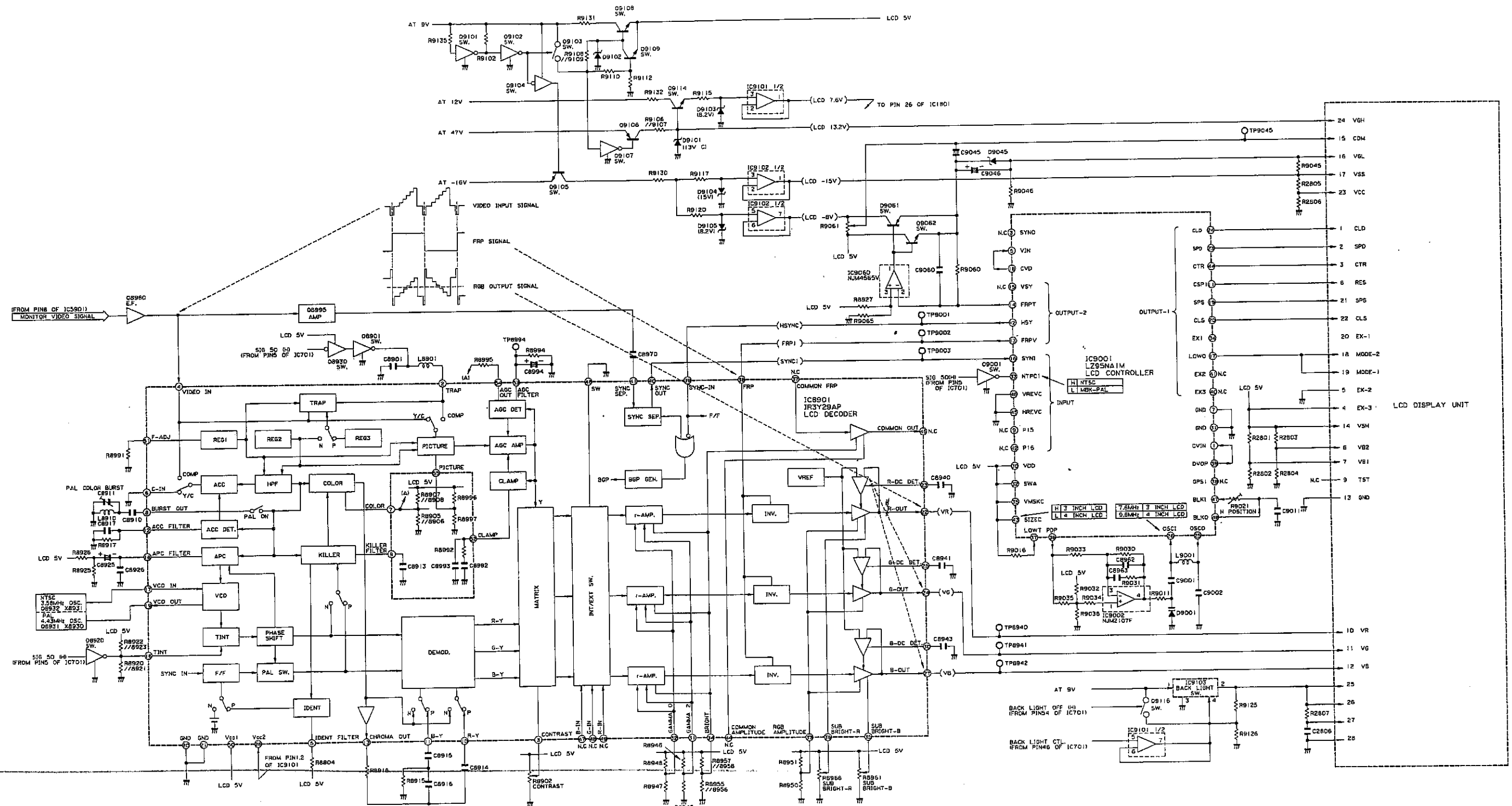


# AUDIO BLOCK DIAGRAM 音频装置电路的方框图

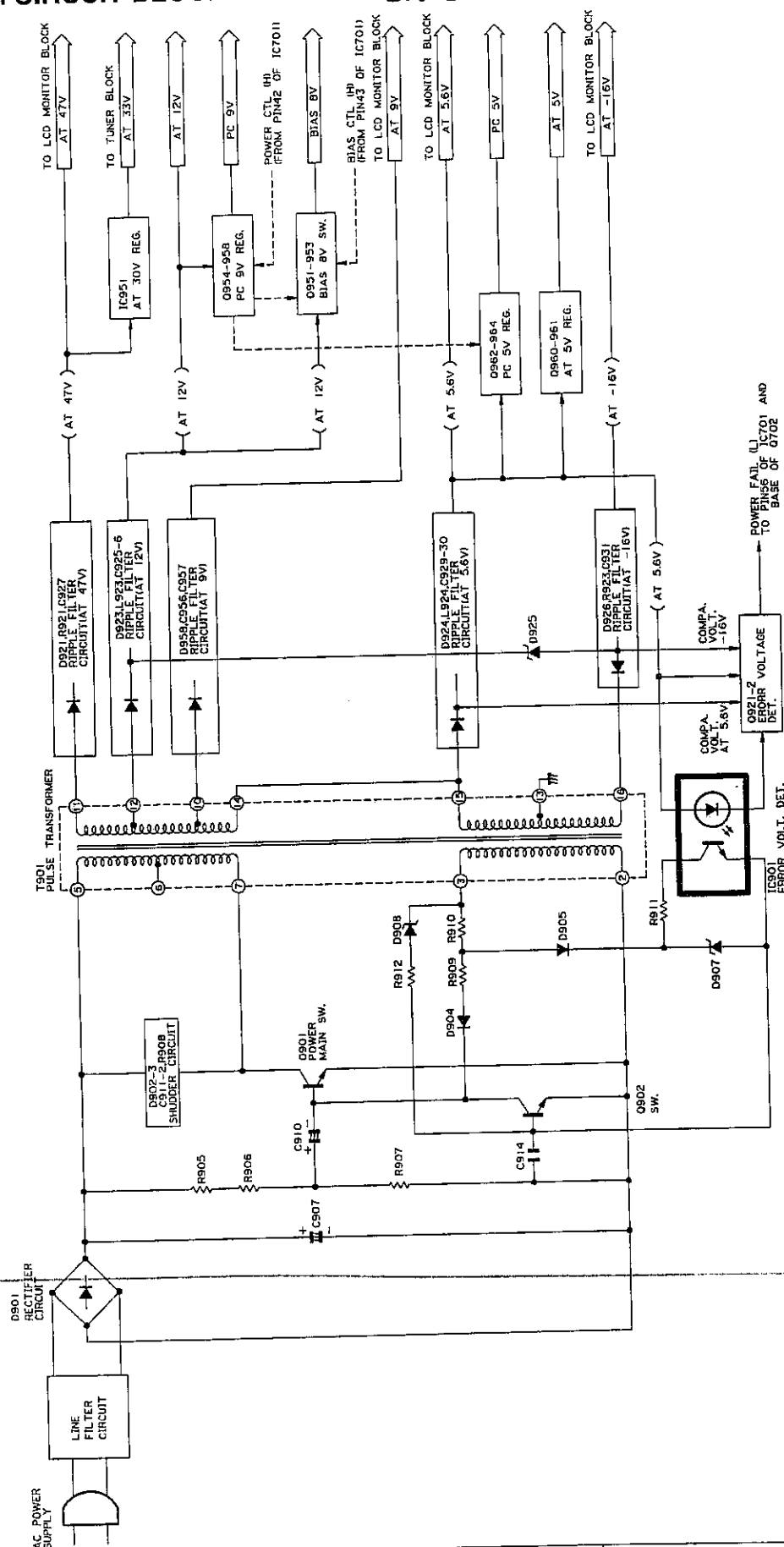
PLAYBACK SIGNAL 再现信号  
RECORDING SIGNAL 记录信号  
E-E SIGNAL E-E信号



MONITOR BLOCK DIAGRAM 监控用彩色电视电路方框图



## POWER CIRCUIT BLOCK DIAGRAM 电源电路方框图





## SCHEMATIC DIAGRAM

### IMPORTANT SAFETY NOTICE:

BE SURE TO USE GENUINE PARTS FOR SECURING THE SAFETY AND RELIABILITY OF THE SET.

PARTS MARKED WITH "  $\Delta$  " AND PARTS SHADED (IN BLACK) ARE ESPECIALLY IMPORTANT FOR MAINTAINING THE SAFETY AND PROTECTING ABILITY OF THE SET.

BE SURE TO REPLACE THEM WITH PARTS OF SPECIFIED PART NUMBER.

### SAFETY NOTES:

1. DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.
2. SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.

### NOTES:

1. The unit of resistance "ohm" is omitted ( $k=1000$  ohm,  $M=1$  Meg ohm).
2. All resistors are 1/8 watt, unless otherwise noted.
3. The unit of capacitance "F" is omitted ( $\mu=\mu F$ ,  $p=\mu\mu F$ ).
4. The values in parentheses are the ones in the PB mode; the values without parentheses are the ones in the REC mode.

### VOLTAGE MEASUREMENT CONDITIONS:

1. DC voltages are measured between points indicated and chassis ground by VTVM, with AC110-240V, 50/60Hz supplied to unit and all controls are set to normal viewing picture unless otherwise noted.
2. Voltages are measured with 10000 $\mu V$  B & W or colour noted.

### WAVEFORM MEASUREMENT CONDITIONS:

10000 $\mu V$  87.5 percent modulated colour bar signal is fed into tuner.

### CAUTION:

This circuit diagram is original one. Therefore there may be a slight difference from yours.

## 电路原理图

### 安全使用注意要点:

为了保证本装置的安全性及可靠性, 务请使用该型号装置的原配零件。

注有 $\Delta$ 标记, 以及打有黑色阴影线的部分, 对于保护本装置的安全、保持其使用性能及使用寿命极其重要。

更换这些部件时, 务请使用规定编号者。

### 安全使用注意事项:

1. 在进行部件更换之前, 务请拔出电源插头。
2. 本装置工作时, 机芯底座的半导体散热片有触电之虑, 务请注意。

### 电路单位说明:

1. 电阻“欧姆”( $\Omega$ )单位予以略记( $K=$ 千欧,  $M=$ 兆欧姆)。
2. 除特别说明者外, 图中电阻功率均为1/8瓦特。
3. 电容“法拉”(F)单位予以略记( $\mu=$ 微法拉,  $P=$ 微微法拉)。
4. 在括弧内的数值为PB状态, 无括弧的数值为REC状态。

### 电压测定条件

1. 除特别说明者外, 直流电压是以AC110~240V, 50/60Hz交流电源供给本装置时, 将所有控制调节都调至正常状态后, 把VTVM(电子管电压表)连接于测点与底盘接地之间所得的读数。

2. 电压由10000 $\mu V$ 黑白或彩色信号测定。

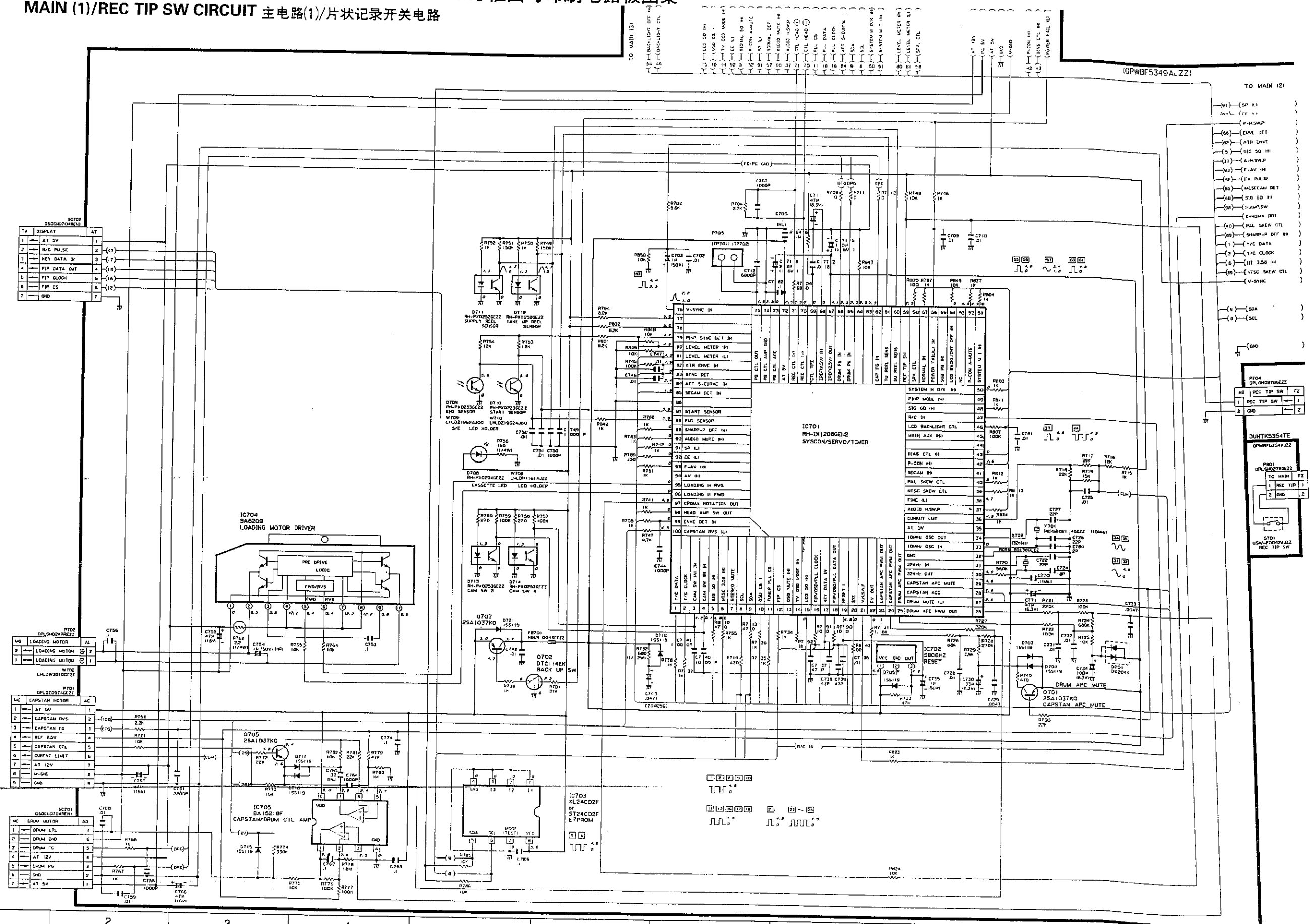
### 波形测定条件:

向调谐器输入10000 $\mu V$ 的87.5%调制色带信号的状态时进行测量。

### 注意:

这里的电路原理图均为最初设计原图, 与您的机器的电路原理图可能有不同之处。

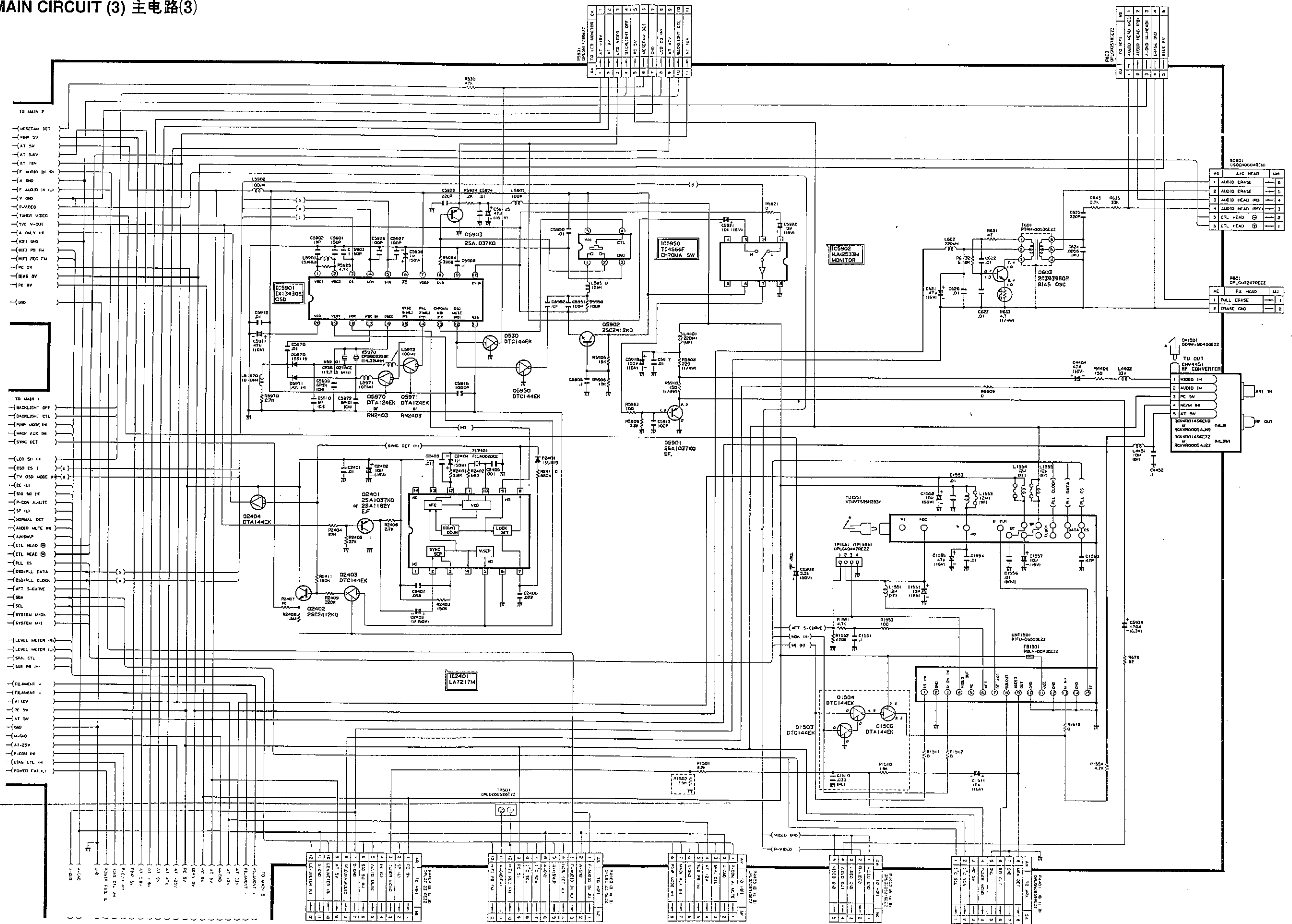
# 9. CIRCUIT DIAGRAM AND PWB FOIL PATTERN 电路方框图与印刷电路板图案 MAIN (1)/REC TIP SW CIRCUIT 主电路(1)/片状记录开关电路



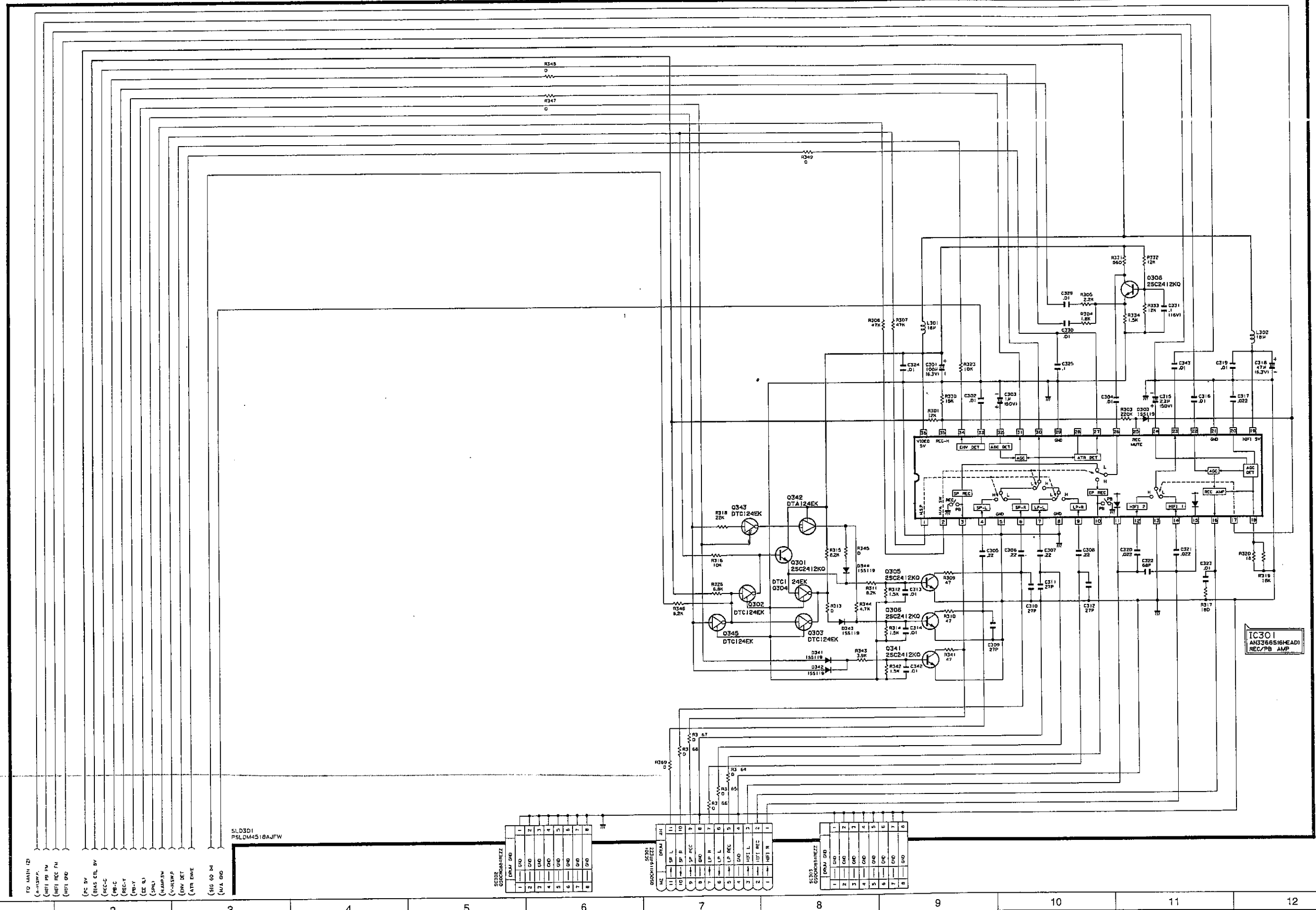
[illegible]

# MAIN CIRCUIT (3) 主电路(3)

VC-ML3  
VC-ML3W  
VC-ML3  
VC-ML3W

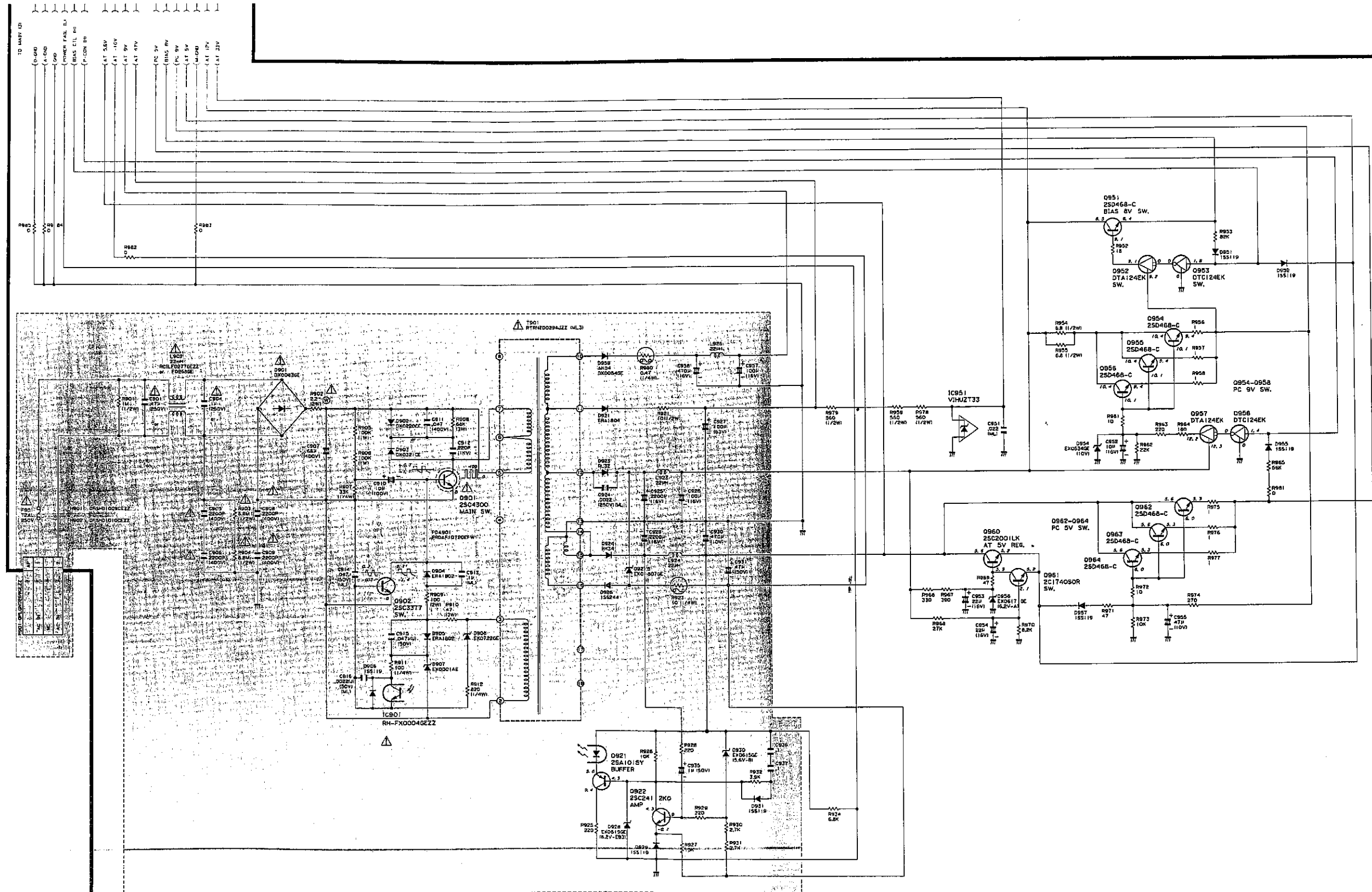


\* VOLTAGE MEASUREMENT MODE ● 电压测量数值  
PB ..... Parentheses ( ) 再现: 括弧内的数值  
REC ..... Without Parentheses 记录: 无括弧的数值

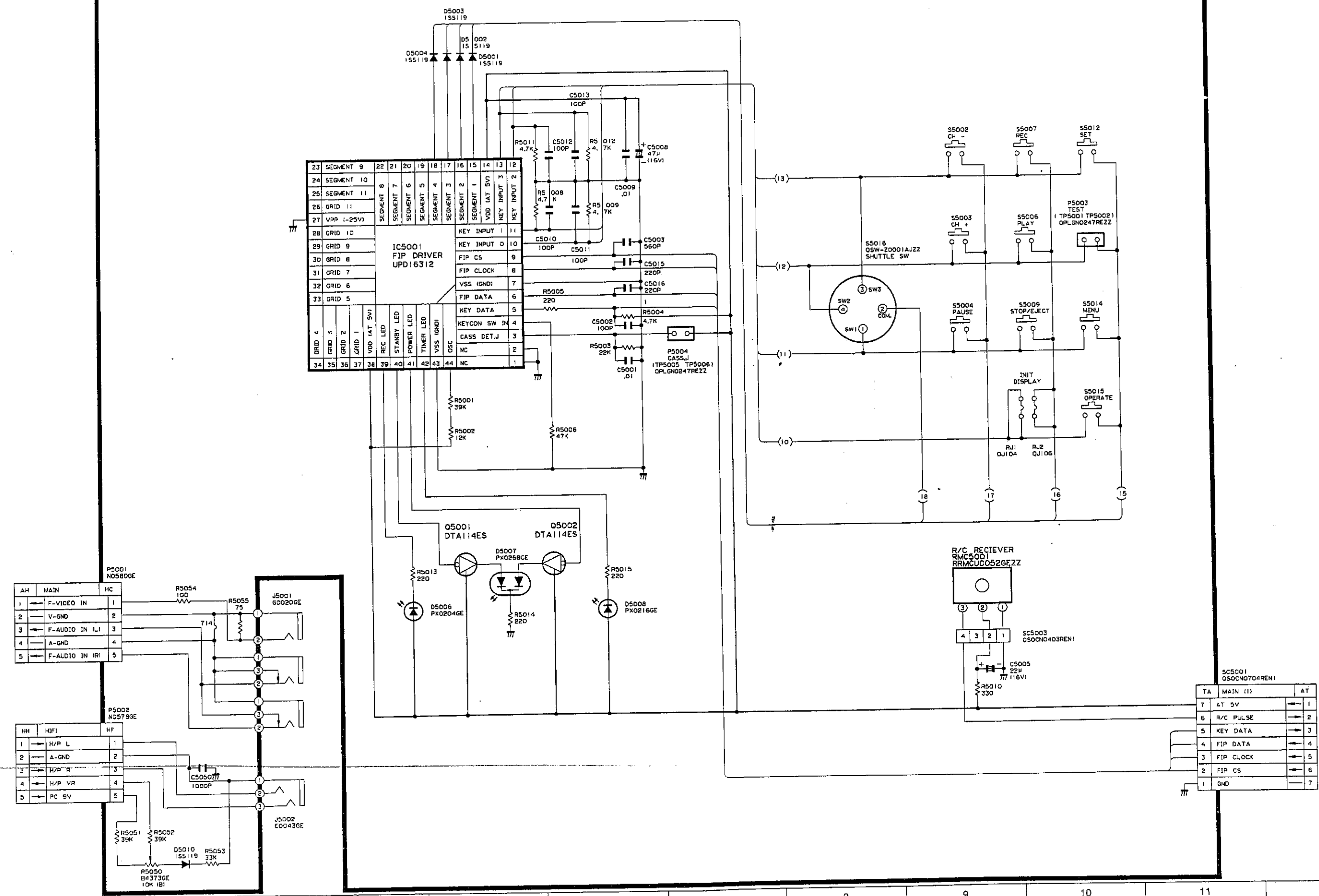


- 电压测量数值
  - 再现：括弧内的数值
  - 记录：无括弧的数值

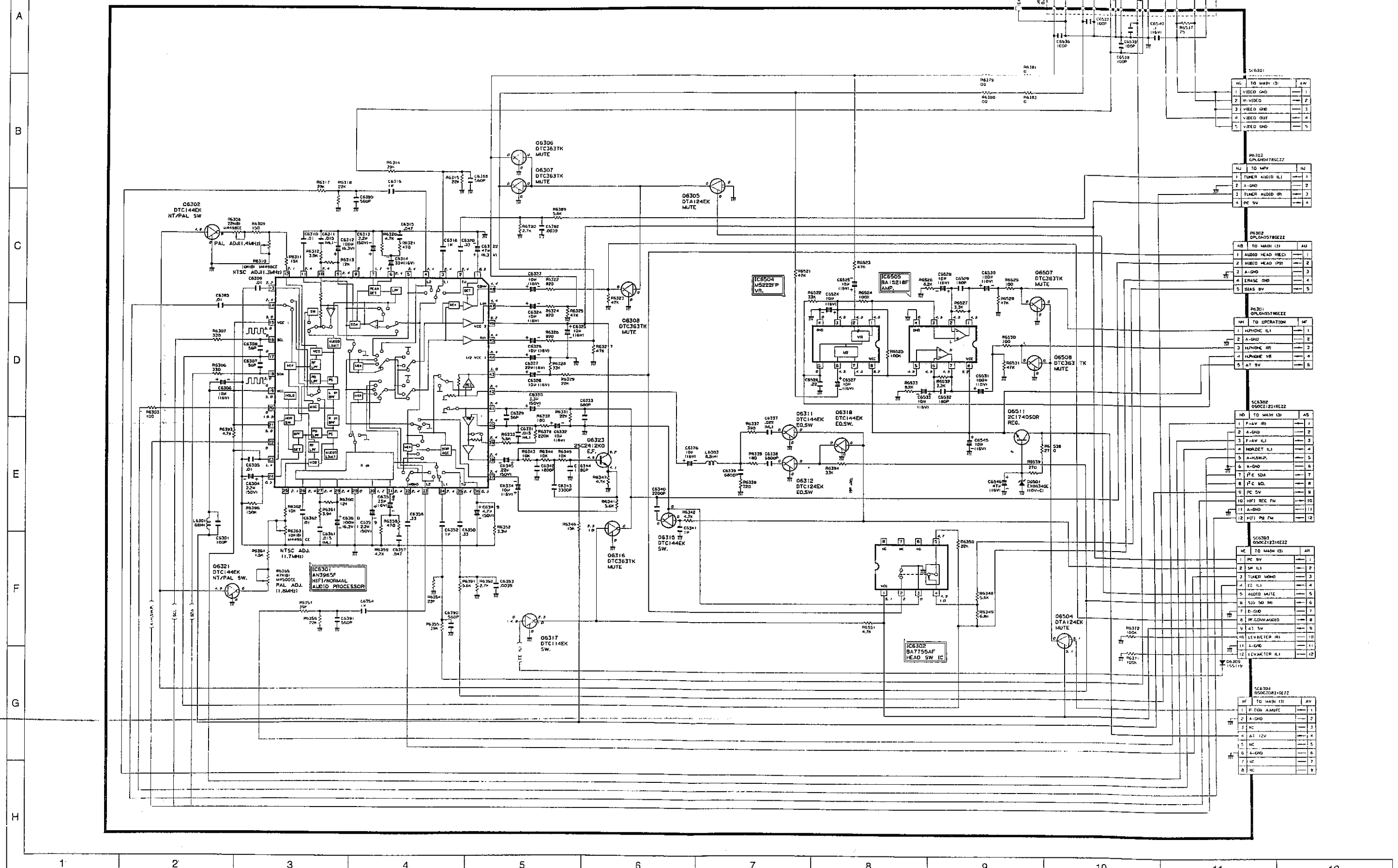
MAIN CIRCUIT (5) 主电路(5)



# OPERATION CIRCUIT 工作电路



Hi-Fi CIRCUIT Hi-Fi电路



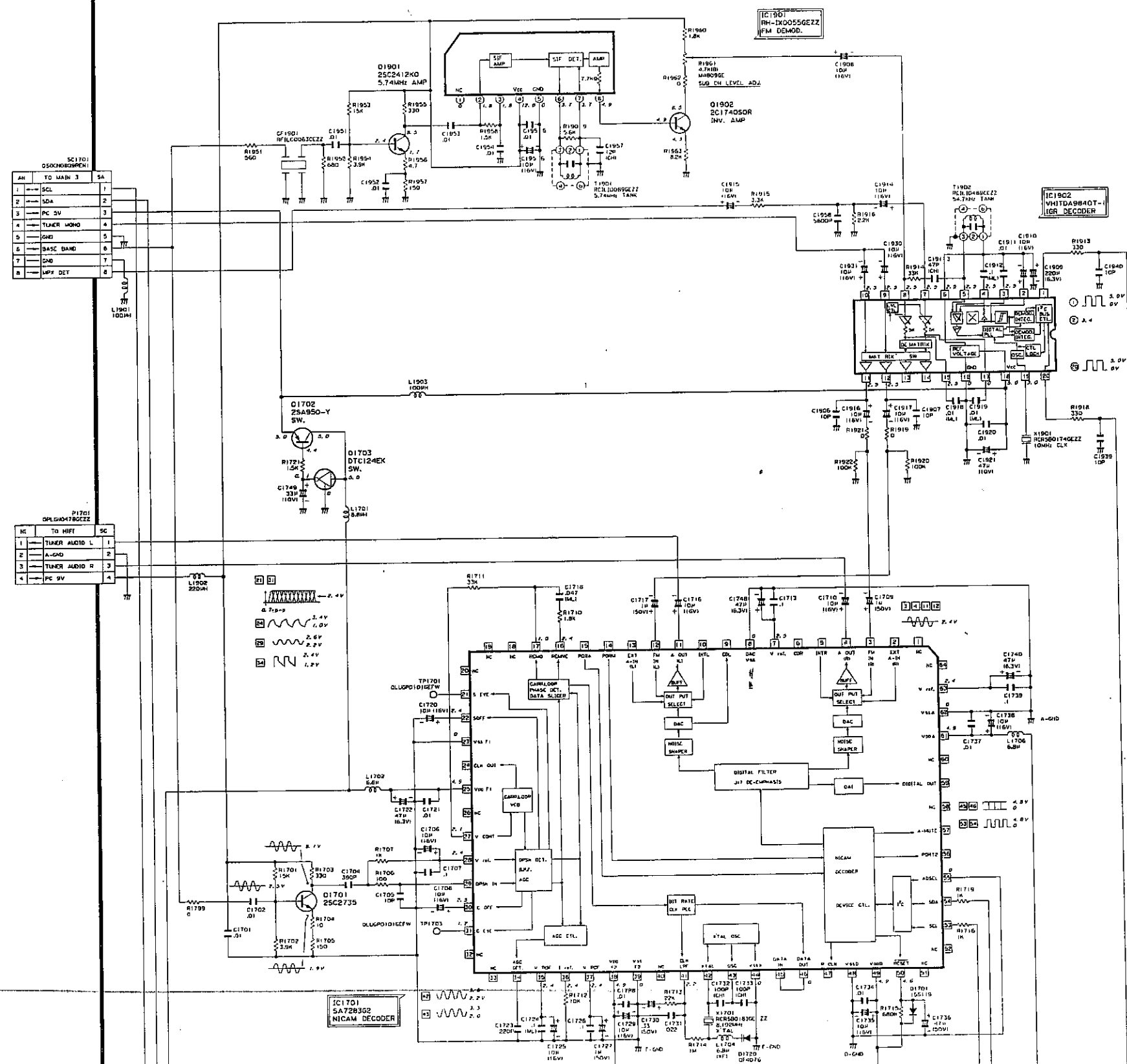
\* VOLTAGE MEASUREMENT MODE ●电压测量数值  
 PB ..... Parentheses ( ) 再现：括弧内の数值  
 REC ..... Without Parentheses 记录：无括弧の数值



# MPX CIRCUIT MPX电路

VC-ML3  
VC-ML3W

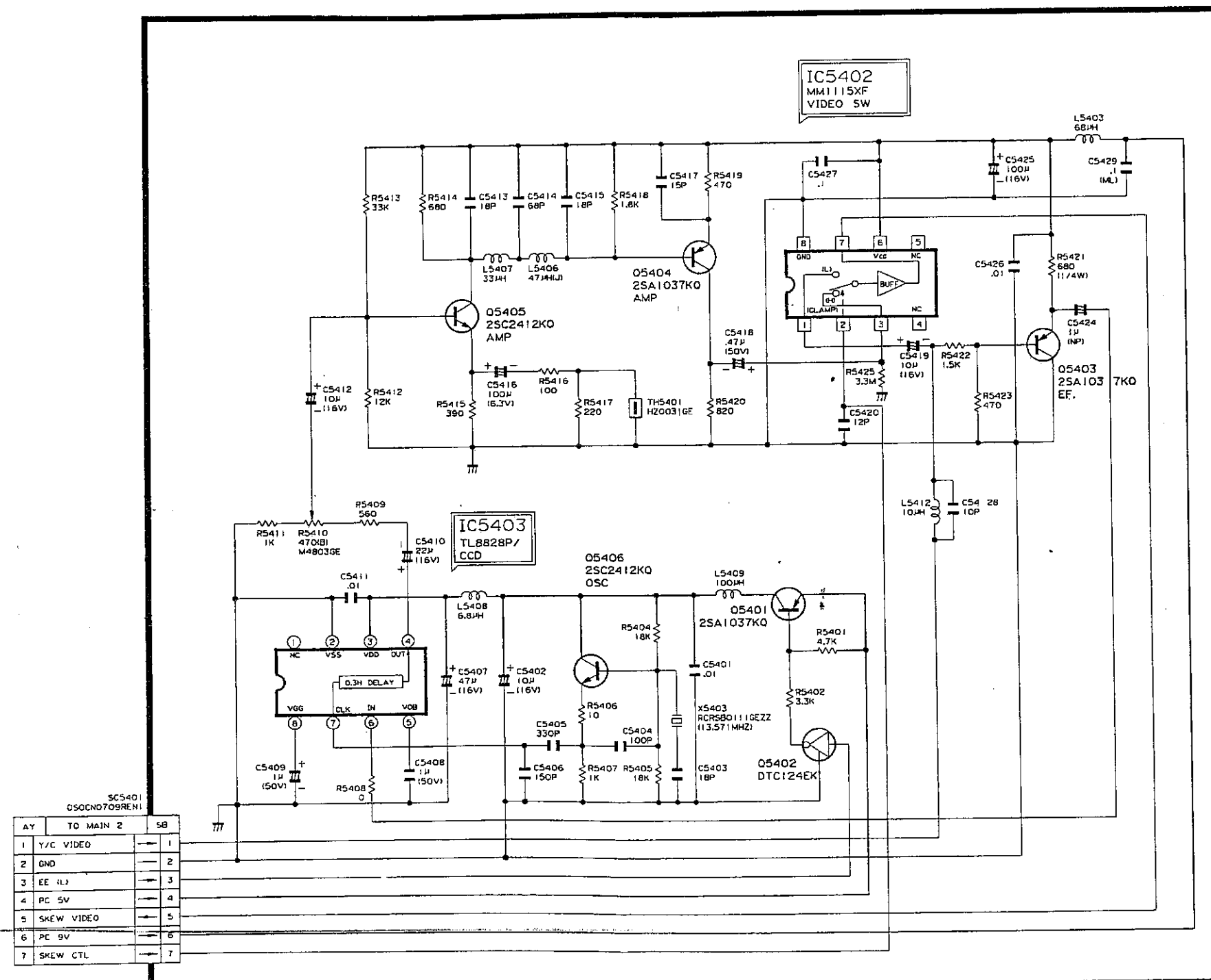
VC-ML3  
VC-ML3W



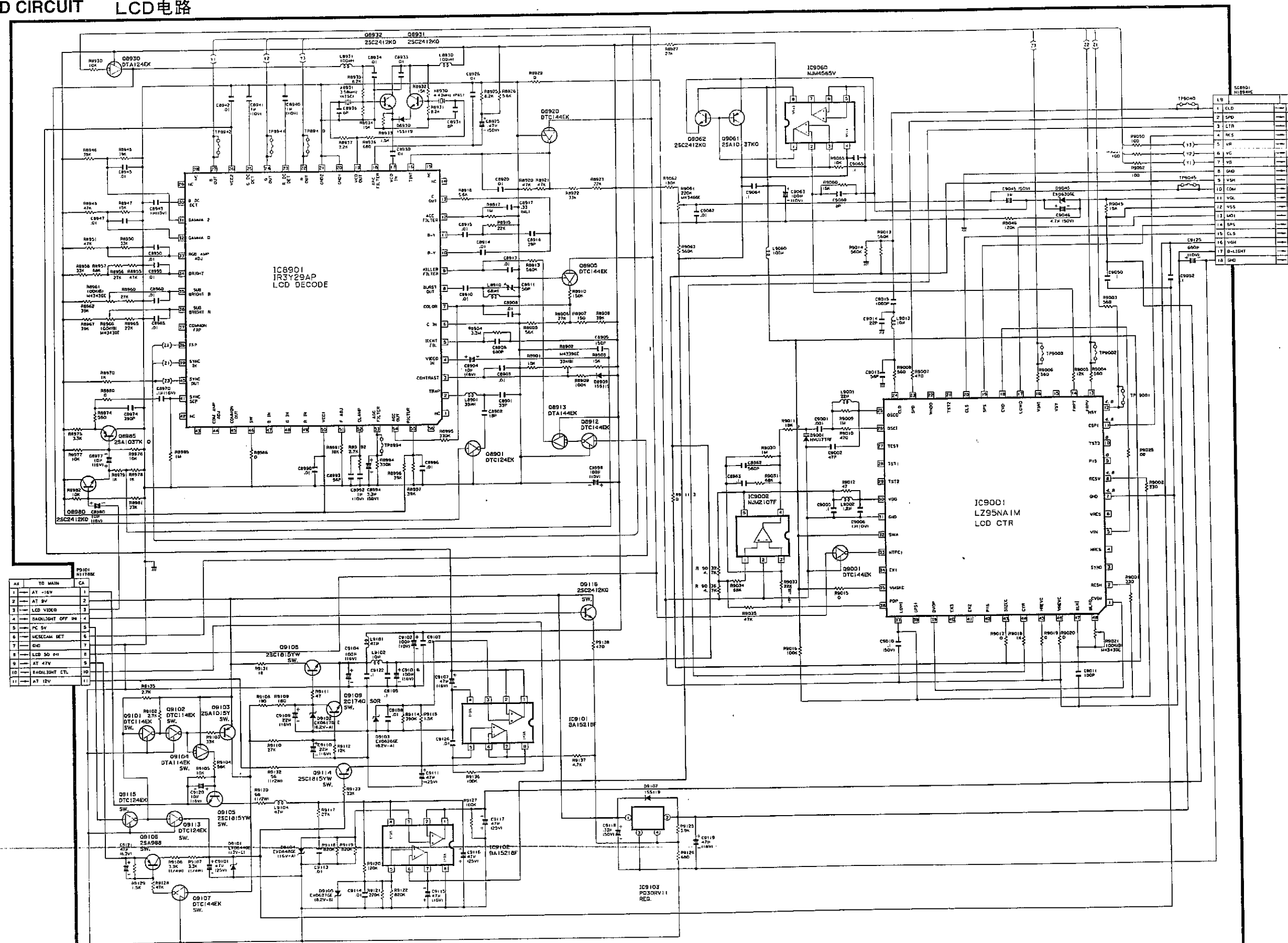
VOLTAGE MEASUREMENT MODE  
PB ..... Parentheses ( )  
REC ..... Without Parentheses

● 电压测量数值  
再现：括弧内的数值  
记录：无括弧的数值

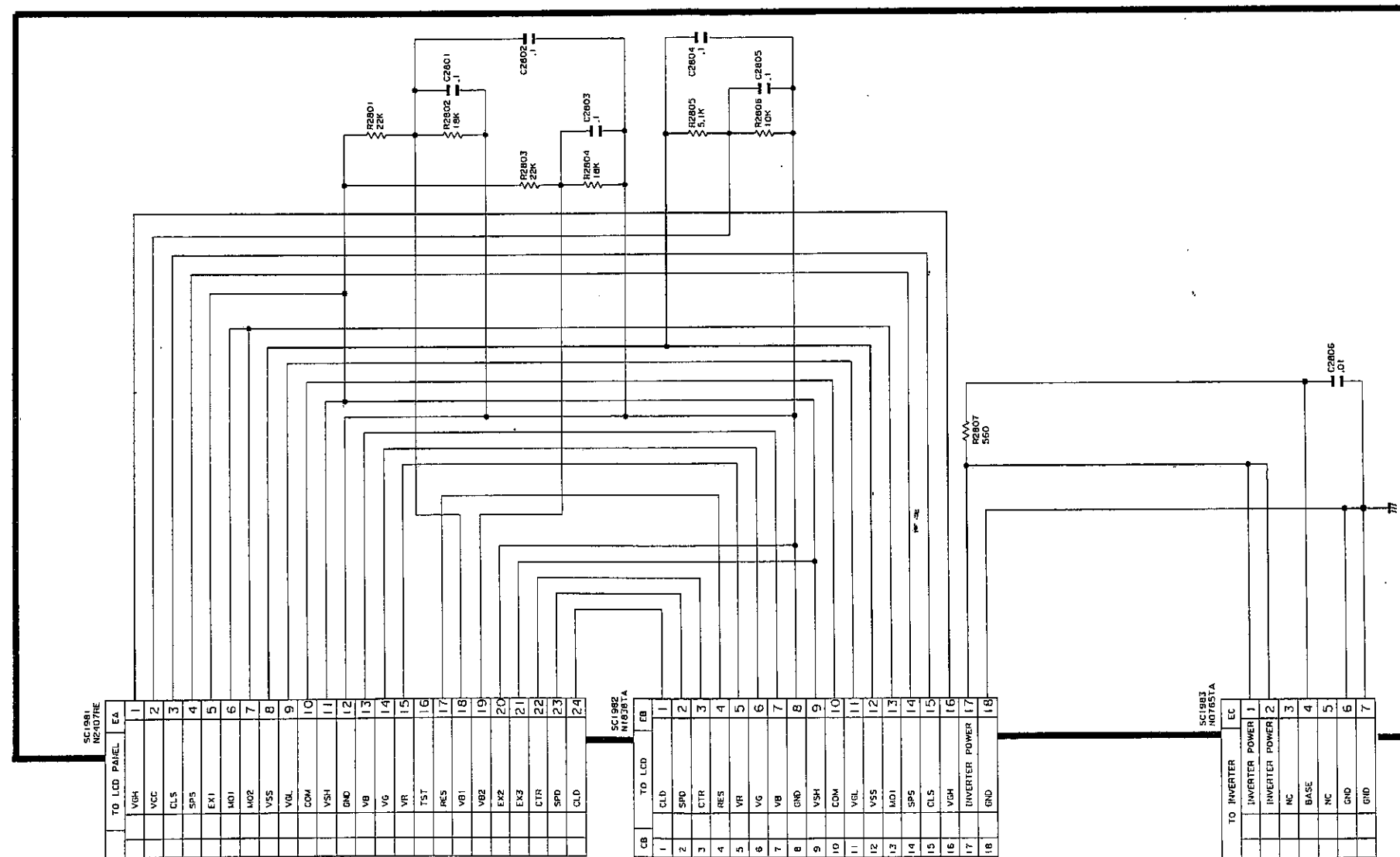
NT SKEW CIRCUIT NT歪斜修正电路



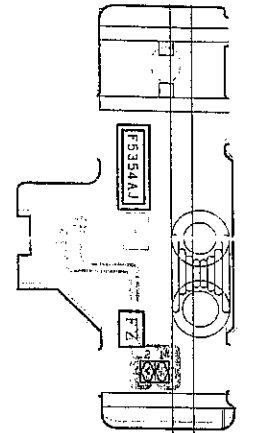
## LCD CIRCUIT LCD 电路



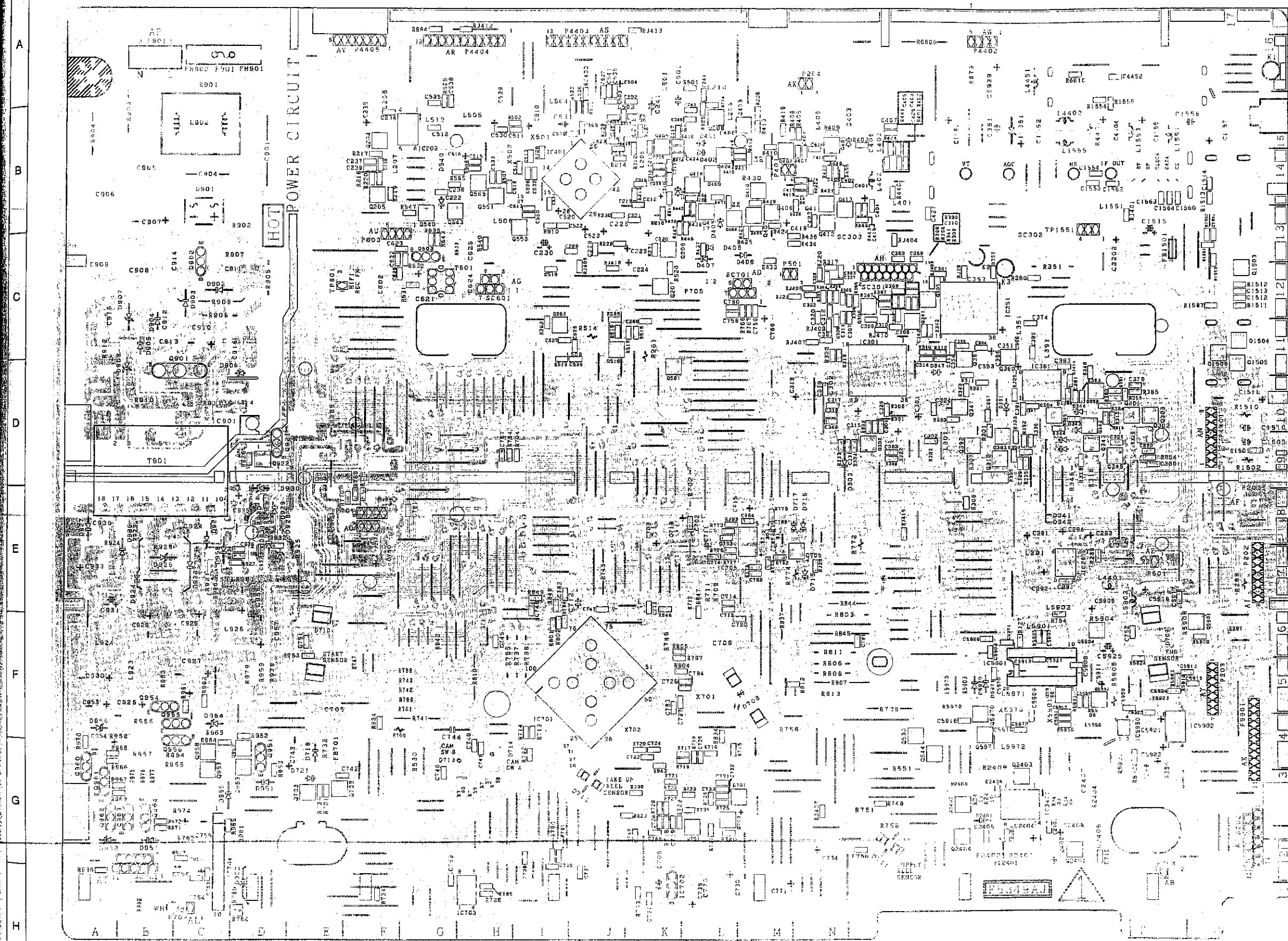
REPLAY CIRCUIT 继电器电路



## PWB FOIL PATTERN 印刷电路板图案

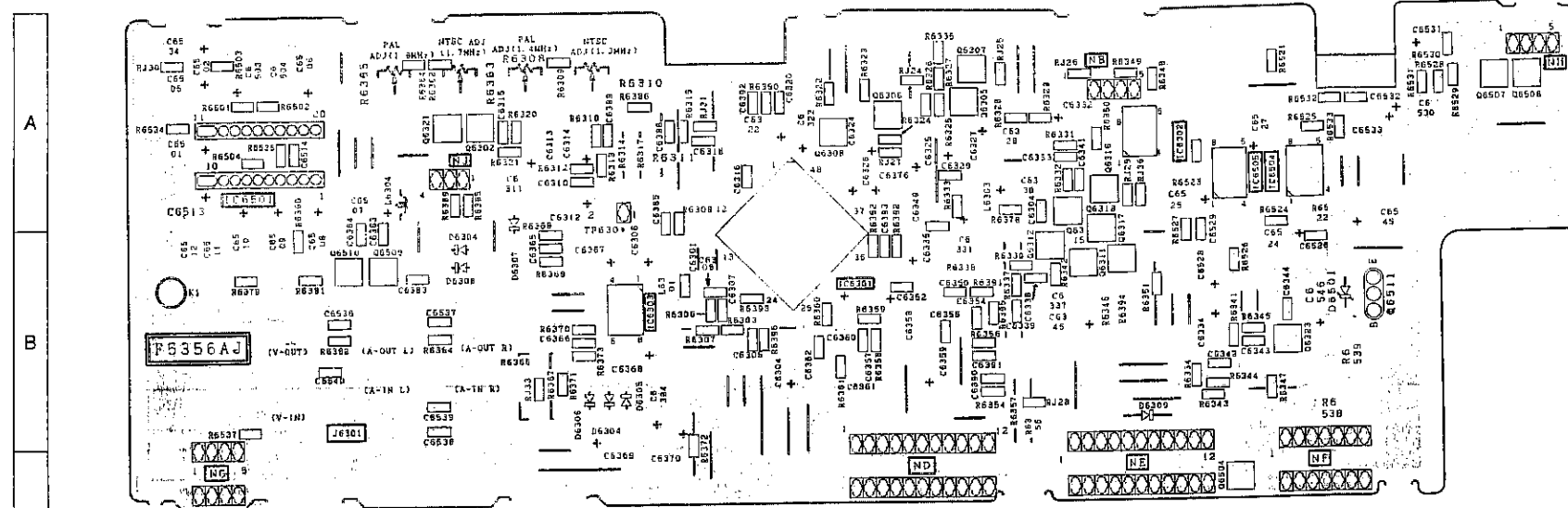


# REC TIP PWB

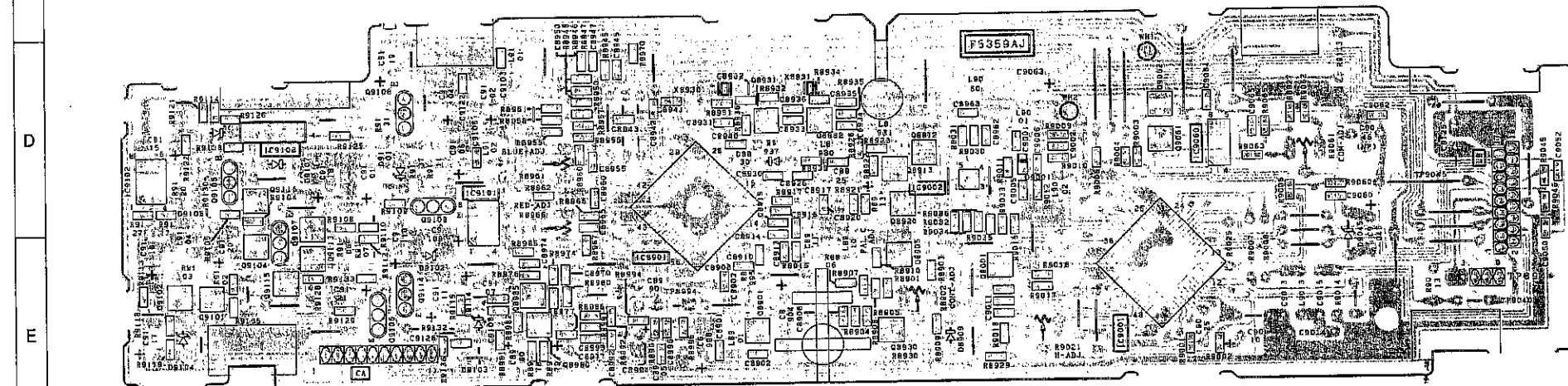


MAIN PWB 主电路印刷电路图

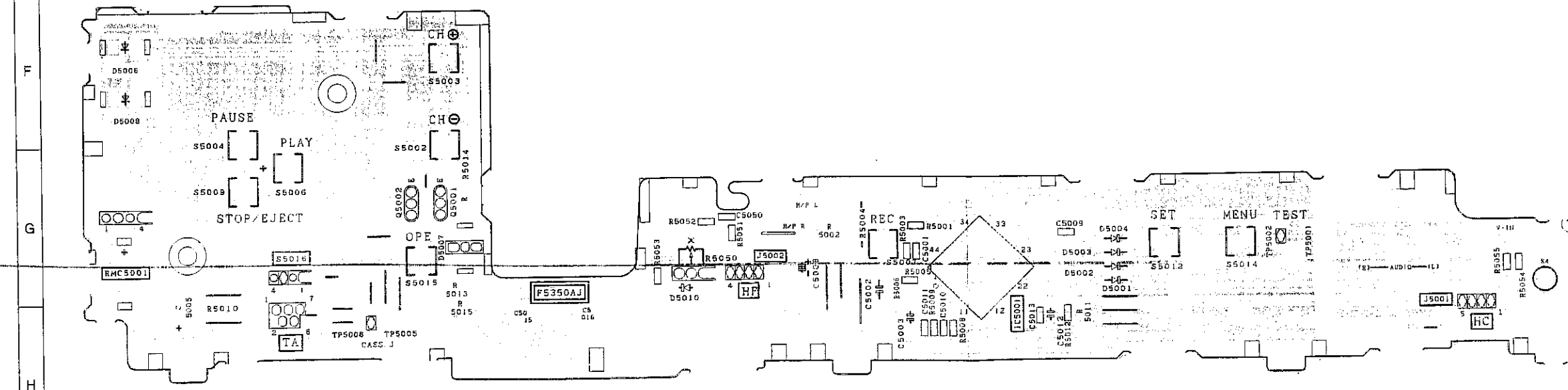
VC-ML3 VC-ML3W VC-ML3 VC-ML3W



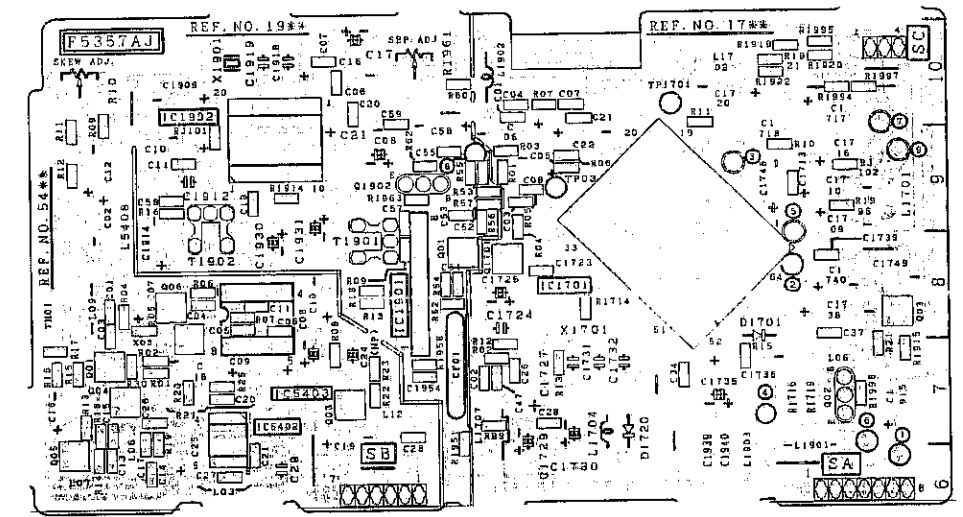
Hi-Fi PWB Hi-Fi 电路印刷电路板



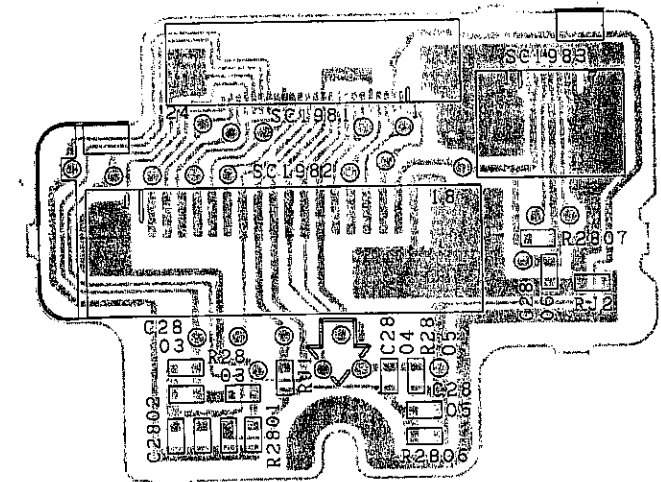
LCD PWB LCD 电路印刷电路板



OPERATION PWB 工作电路印刷电路板



MPX PWB MPX 电路印刷电路板



REPALY PWB 继电器电路印刷电路板

## 10. REPLACEMENT PARTS LIST

### PARTS REPLACEMENT

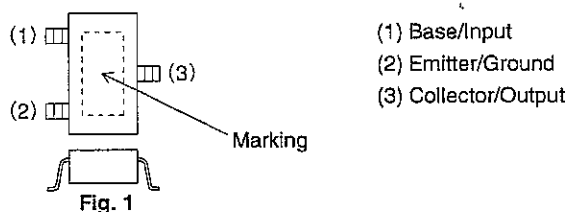
Many electrical and mechanical parts in video cassette recorder have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by  $\Delta$  and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

#### "HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION
5. PRICE CODE

### HOW TO IDENTIFY CHIP TRANSISTORS AND DIODES BY ITS MARKING



Package	Marking	Parts No.
Fig. 1	15	VS2TA124EK/-1
Fig. 1	25	VS2TC124EK/-1
Fig. 1	24	VS2TC114EK/-1
Fig. 1	26	VS2TC144EK/-1
Fig. 1	16	VS2TA144EK/-1
Fig. 1	BQ	VS2SC2412KQ/-1
Fig. 1	FQ	VS2SA1037KQ/-1

MARK ★: SPARE PARTS-DELIVERY SECTION.

Ref. No.	Part No.	★	Description	Code
----------	----------	---	-------------	------

### PRINTED WIRING BOARD ASSEMBLIES

(NOT REPLACEMENT ITEM)

DUNTK5349XM50	-	Main Unit (VC-ML3)	—
DUNTK5349XM53	-	Main Unit (VC-ML3W)	—
DUNTK5350XM50	-	Operation Unit	—
DUNTK5354XM50	-	Rec Tip Unit	—
DUNTK5356XM50	-	Hi-Fi Unit	—
DUNTK5357XM50	-	MPX Unit	—

Ref. No.	Part No.	★	Description	Code
	DUNTK5359XM50	-	LCD Unit	—
	DUNTK5369XJ6B	-	Relay Unit	—

### DUNTK5349XM50 (VC-ML3)

### DUNTK5349XM53 (VC-ML3W)

#### MAIN UNIT

#### TUNER AND ASSEMBLY

CNV4451	RCNVR0146GEN9	J	Converter (VC-ML3)	BB
CNV4451	RCNVR0146GEZZ	J	Converter (VC-ML3W)	BC
TU1551	VTUVTSR6HZ53/	J	Tuner	BD
UNT1501	RIFU-0655GEZZ	J	IF-Pack	BH

#### INTEGRATED CIRCUITS

IC202	VHiMSM7470M-1	J	MSM7470	BD
IC291	VHiMM1111XF1E	J	MM1111	AE
IC301	VHiAN3366S/-1	J	AN3366S	AP
IC401	VHiHA8201CF-1	J	HA8201CF	AW
IC701	RH-IX1208GEZZ	J	IX1208GE	AZ
IC702	VHiS806HZ/-1	J	S806HZ	AC
IC703	VHiXL24C02F-1	J	XL24C02F	AH
IC704	VHiBA6209//1E	J	BA6209	AG
IC705	VHiBA15218F1E	J	BA15218F	AF
IC951	VHiUZI33///-1	J	UZI33	AC
IC2401	VHiLA7217M/-1	J	LA7217M	AG
IC5901	RH-IX1343GEZZ	J	IX1343GE	AQ
IC5902	VHiNJM2533M-1	J	NJM2533M	AF
IC5950	VHiTC4S66F/-1	J	TC4S66F	AD

#### TRANSISTORS

Q204	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q205	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q208	VS2TC144EK/-1	J	DTC144EK	AB
Q301	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q302	VS2TC124EK/-1	J	DTC124EK	AB
Q303	VS2TC124EK/-1	J	DTC124EK	AB
Q304	VS2TC124EK/-1	J	DTC124EK	AB
Q305	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q306	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q308	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q341	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q342	VS2TA124EK/-1	J	DTA124EK	AB
Q343	VS2TC124EK/-1	J	DTC124EK	AB
Q345	VS2TC124EK/-1	J	DTC124EK	AB
Q401	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q402	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q403	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q404	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q405	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q406	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q407	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q408	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q409	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q410	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q411	VS2TC144EK/-1	J	DTC144EK	AB



Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
<b>TRANSISTORS (Continued)</b>					<b>DIODES (Continued)</b>				
Q412	VS2SC2412KQ-1	J	2SC2412KQ	AA	D344	VHD1SS119//-1	J	1SS119	AB
Q413	VS2SA1037KQ-1	J	2SA1037KQ	AA	D401	VHD1SS119//-1	J	1SS119	AB
Q417	VSDTC144EK/-1	J	DTC144EK	AB	D402	VHD1SS119//-1	J	1SS119	AB
Q418	VS2SC2412KQ-1	J	2SC2412KQ	AA	D403	VHD1SS119//-1	J	1SS119	AB
Q501	VSDTC144EK/-1	J	DTC144EK	AB	D405	VHD1SS119//-1	J	1SS119	AB
Q530	VSDTC144EK/-1	J	DTC144EK	AB	D406	VHD1SS119//-1	J	1SS119	AB
Q540	VSDTC144EK/-1	J	DTC144EK	AB	D408	VHD1SS119//-1	J	1SS119	AB
Q543	VSDTC144EK/-1	J	DTC144EK	AB	D540	VHD1SS119//-1	J	1SS119	AB
Q544	VSDTC144EK/-1	J	DTC144EK	AB	D701	VHDDA204K/1E	J	DA204K	AB
Q550	VSDTC144EK/-1	J	DTC144EK	AB	D703	VHD1SS119//-1	J	1SS119	AB
Q551	VSDTC144EK/-1	J	DTC144EK	AB	D705	VHD1SS119//-1	J	1SS119	AB
Q565	VSDTC144EK/-1	J	DTC144EK	AB	D708	RH-PX0234GEZZ	J	Photo Diode	AD
Q603	VS2C3939SQR-1	J	2SC3939SQR	AC	D709	RH-PX0233GEZZ	J	Photo Diode	AD
Q701	VS2SA1037KQ-1	J	2SA1037KQ	AA	D710	RH-PX0233GEZZ	J	Photo Diode	AD
Q702	VSDTC114EK/-1	J	DTC114EK	AB	D711	RH-PX0252GEZZ	J	Photo Diode	AF
Q703	VS2SA1037KQ-1	J	2SA1037KQ	AA	D712	RH-PX0252GEZZ	J	Photo Diode	AF
Q705	VS2SA1037KQ-1	J	2SA1037KQ	AA	D713	RH-PX0253GEZZ	J	Photo Diode	AF
△ Q901	VS2SC4300/-1	J	2SC4300	AM	D714	RH-PX0253GEZZ	J	Photo Diode	AF
△ Q902	VS2SC3377-Q-1	J	2SC3377-Q	AC	D715	VHD1SS119//-1	J	1SS119	AB
△ Q921	VS2SA1015Y/1E	J	2SA1015Y	AC	D716	VHD1SS119//-1	J	1SS119	AB
△ Q922	VS2SC2412KQ-1	J	2SC2412KQ	AA	D717	VHD1SS119//-1	J	1SS119	AB
Q951	VS2SD468-C/-1	J	2SD468-C	AD	D718	VHD1SS119//-1	J	1SS119	AB
Q952	VSDTA124EK/-1	J	DTA124EK	AB	D721	VHD1SS119//-1	J	1SS119	AB
Q953	VSDTC124EK/-1	J	DTC124EK	AB	△ D901	RH-DX0083GEZZ	J	Diode Bridge	AC
Q954	VS2SD468-C/-1	J	2SD468-C	AD	△ D902	RH-DX0220CEZZ	J	Diode	AB
Q955	VS2SD468-C/-1	J	2SD468-C	AD	△ D903	RH-DX0321CEZZ	J	Diode	AC
Q956	VS2SD468-C/-1	J	2SD468-C	AD	△ D904	VHDERA1802/-1	J	ERA1802	AB
Q957	VSDTA124EK/-1	J	DTA124EK	AB	△ D905	VHDERA1802/-1	J	ERA1802	AB
Q958	VSDTC124EK/-1	J	DTC124EK	AB	△ D906	VHD1SS119//-1	J	1SS119	AB
Q960	VS2SC2001LK-1	J	2SC2001LK	AA	△ D907	RH-EX0001AEZZ	J	Zener Diode	AC
Q961	VS2C1740SQR1E	J	2SC1740SQR	AC	△ D908	RH-EX0722GEZZ	J	Zener Diode	AA
Q962	VS2SD468-C/-1	J	2SD468-C	AD	△ D921	VHDERA1804/-1	J	ERA1804	AD
Q963	VS2SD468-C/-1	J	2SD468-C	AD	△ D923	VHDL3Z///-1	J	RL3Z	AE
Q964	VS2SD468-C/-1	J	2SD468-C	AD	△ D924	VHDL3Z///-1	J	RL3Z	AE
Q1503	VSDTC144EK/-1	J	DTC144EK	AB	△ D925	RH-EX0807GEZZ	J	Zener Diode	AC
Q1504	VSDTC144EK/-1	J	DTC144EK	AB	△ D926	VHD1SS244//-1	J	1SS244	AB
Q1506	VSDTA144EK/-1	J	DTA144EK	AC	△ D928	RH-EX0619GEZZ	J	Zener Diode	AA
Q2401	VS2SA1037KQ-1	J	2SA1037KQ	AA	△ D929	VHD1SS119//-1	J	1SS119	AB
Q2402	VS2SC2412KQ-1	J	2SC2412KQ	AA	△ D930	RH-EX0615GEZZ	J	Zener Diode	AA
Q2403	VSDTC144EK/-1	J	DTC144EK	AB	△ D931	VHD1SS119//-1	J	1SS119	AB
Q2404	VSDTA144EK/-1	J	DTA144EK	AC	D951	VHD1SS119//-1	J	1SS119	AB
Q5901	VS2SA1037KQ-1	J	2SA1037KQ	AA	D952	VHD1SS119//-1	J	1SS119	AB
Q5902	VS2SC2412KQ-1	J	2SC2412KQ	AA	D954	RH-EX0634GEZZ	J	Zener Diode	AA
Q5903	VS2SA1037KQ-1	J	2SA1037KQ	AA	D955	VHD1SS119//-1	J	1SS119	AB
Q5950	VSDTC144EK/-1	J	DTC144EK	AB	D956	RH-EX0617GEZZ	J	Zener Diode	AA
Q5970	VSDTA124EK/-1	J	DTA124EK	AB	D957	VHD1SS119//-1	J	1SS119	AB
Q5971	VSDTA124EK/-1	J	DTA124EK	AB	△ D958	RH-DX0064GEZZ	J	AK04	AC
<b>DIODES</b>					D2401	VHD1SS119//-1	J	1SS119	AB
D201	VHD1SS119//-1	J	1SS119	AB	D5970	VHD1SS119//-1	J	1SS119	AB
D303	VHD1SS119//-1	J	1SS119	AB	D5971	VHD1SS119//-1	J	1SS119	AB
D341	VHD1SS119//-1	J	1SS119	AB	△ IC901	RH-FX0004GEZZ	J	Photo Coupler	AG
D342	VHD1SS119//-1	J	1SS119	AB					
D343	VHD1SS119//-1	J	1SS119	AB					



Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
<b>PACKAGED CIRCUIT</b>					<b>CONTROLS</b>				
X501	RCRSB0166GEZZ	J	Crystal, 4.43MHz	AG	R430	RVR-M4782GEZZ	J	2.2k (B), Hard Adj.	AB
X502	RCRSB0188GEZZ	J	Crystal, 3.58MHz	AG	<b>CAPACITORS</b>				
X701	RCRSB0214GEZZ	J	Crystal, 10MHz	AG	C210	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
X702	RCRSB0138GEZZ	J	Crystal, 32KHz	AD	C211	VCCCCY1HH270J	J	27p 50V Ceramic	AA
X5901	RCRSB0215GEZZ	J	Crystal, 17.73MHz	AG	C212	VCEAEM1HW474M	J	0.47 50V Electrolytic	AB
X5970	RCRSB0222GEZZ	J	Crystal, 14.32MHz	AF	C214	VCKYCY1CF224Z	J	0.22 16V Ceramic	AA
<b>COILS AND TRANSFORMERS</b>					C215	VCCCCY1HH101J	J	100p 50V Ceramic	AA
FL2401	RFILA0020CEZZ	J	Filter	AD	C216	VCCCCY1HH100D	J	10p 50V Ceramic	AA
L205	VP-XF101K0000	J	100μH	AB	C217	VCKYCY1AF105Z	J	1 10V Ceramic	AC
L206	VP-DF470K0000	J	47μH	AB	C218	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
L207	VP-XF560J0000	J	56μH	AB	C219	VCCCCY1HH121J	J	120p 50V Ceramic	AA
L208	VP-XF151K0000	J	150μH	AB	C220	VCEAEM1HW335M	J	3.3 50V Electrolytic	AB
L209	VP-XF560J0000	J	56μH	AB	C221	VCKYCY1CB473K	J	0.047 16V Ceramic	AA
L210	VP-XF151K0000	J	150μH	AB	C222	VCKYCY1CF104Z	J	0.1 16V Ceramic	AA
L291	VP-ZK101K0000	J	100μH	AB	C223	VCEAEM1HW335M	J	3.3 50V Electrolytic	AB
L301	VP-ZK180K0000	J	18μH	AB	C224	VCEAEM1HW225M	J	2.2 50V Electrolytic	AB
L302	VP-ZK180K0000	J	18μH	AB	C226	VCEAEM1HW474M	J	0.47 50V Electrolytic	AB
L401	VP-DF221K0000	J	220μH	AB	C228	VCKYCY1CF224Z	J	0.22 16V Ceramic	AA
L402	VP-XF151K0000	J	150μH	AB	C229	VCKYCY1CF104Z	J	0.1 16V Ceramic	AA
L403	VP-XF150J0000	J	15μH	AB	C230	VCEAEM0JW107M	J	100 6.3V Electrolytic	AB
L404	VP-XF330J0000	J	33μH	AB	C234	VCKYCY1CB473K	J	0.047 16V Ceramic	AA
L405	VP-XF2R7J0000	J	2.7μH	AC	C235	VCEAEM1CW106M	J	10 16V Electrolytic	AB
L406	VP-XF560J0000	J	56μH	AB	C236	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
L407	VP-XF5R6K0000	J	5.6μH	AB	C237	VCCCCY1HH330J	J	33p 50V Ceramic	AA
L408	VP-XF101K0000	J	100μH	AB	C238	VCCCCY1HH5R0C	J	5p 50V Ceramic	AA
L501	VP-MK561K0000	J	560μH	AB	C239	VCCCCY1HH560J	J	56p 50V Ceramic	AA
L502	VP-XF560K0000	J	56μH	AB	C240	VCKYCY1HB391K	J	390p 50V Ceramic	AA
L504	VP-XF150J0000	J	15μH	AB	C241	VCKYD41HB151K	J	150p 50V Ceramic	AA
L505	VP-XF100K0000	J	10μH	AB	C244	VCKYCY1HB221K	J	220p 50V Ceramic	AA
L506	VP-XF470K0000	J	47μH	AB	C260	VCKYCY1EB103K	J	0.01 25V Ceramic	AA
L507	VP-XF101K0000	J	100μH	AB	C281	VCEAEM1CW226M	J	22 16V Electrolytic	AB
L509	VP-XF151K0000	J	150μH	AB	C289	VCEAEM1HW106M	J	10 50V Electrolytic	AB
L512	VP-XF6R8K0000	J	6.8μH	AB	C291	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
L602	VP-2K221K000K	J	220μH	AB	C292	VCEAEM1CW106M	J	10 16V Electrolytic	AB
△ L902	RCILF0277GEZZ	J	Coil	AG	C293	VCEAEM1CW226M	J	22 16V Electrolytic	AB
△ L923	RCILP0232CEZZ	J	Coil	AD	C294	VCEAEM1AW226M	J	22 10V Electrolytic	AB
△ L924	RCILP0232CEZZ	J	Coil	AD	C301	VCEAEM0JW107M	J	100 6.3V Electrolytic	AB
△ L926	RCILP0232CEZZ	J	Coil	AD	C302	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
L1551	VP-XF120K0000	J	12μH	AB	C303	VCEAEM1HW105M	J	1 50V Electrolytic	AB
L1553	VP-XF120K0000	J	12μH	AB	C304	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
L4401	VP-MK221K0000	J	220μH	AB	C305	VCKYCY1CF224Z	J	0.22 16V Ceramic	AA
L4402	VP-XF330K0000	J	33μH	AB	C306	VCKYCY1CF224Z	J	0.22 16V Ceramic	AA
L4451	VP-DF100K0000	J	10μH	AB	C307	VCKYCY1CF224Z	J	0.22 16V Ceramic	AA
L5901	VP-XF150J0000	J	15μH	AB	C308	VCKYCY1CF224Z	J	0.22 16V Ceramic	AA
L5902	VP-DF101K0000	J	100μH	AB	C309	VCCCCY1HH270J	J	27p 50V Ceramic	AA
L5903	VP-DF101K0000	J	100μH	AB	C310	VCCCCY1HH270J	J	27p 50V Ceramic	AA
L5950	VP-XF120K0000	J	12μH	AB	C311	VCCCCY1HH270J	J	27p 50V Ceramic	AA
L5970	VP-XF101K0000	J	100μH	AB	C312	VCCCCY1HH270J	J	27p 50V Ceramic	AA
L5971	VP-XF101K0000	J	100μH	AB	C313	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
L5972	VP-XF101K0000	J	100μH	AB	C314	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
T601	RTRNH0053GEZZ	J	OSC. Transformer	AE	C315	VCEAEM1HW225M	J	2.2 50V Electrolytic	AB
△ T901	RTRNZ0029AJZZ	V	Transformer	AP	C316	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
					C317	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB

Ref. No.	Part No.	★	Description	Code
<b>CAPACITORS (Continued)</b>				
C318	VCEAEM0JW476M	J 47	6.3V Electrolytic	AB
C319	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C320	VCKYCY1HF223Z	J 0.022	50V Ceramic	AB
C321	VCKYCY1HF223Z	J 0.022	50V Ceramic	AB
C322	VCCCCY1HH680J	J 68p	50V Ceramic	AA
C323	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C324	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C325	VCKYCY1EF104Z	J 0.1	25V Ceramic	AA
C329	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C330	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C331	VCKYCY1CF104Z	J 0.1	16V Ceramic	AA
C342	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C343	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C401	VCEAEM1CW476M	J 47	16V Electrolytic	AB
C402	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C403	VCCCCY1HH121J	J 120p	50V Ceramic	AA
C404	VCKYCY1HB391K	J 390p	50V Ceramic	AA
C405	VCCCCY1HH390J	J 39p	50V Ceramic	AA
C406	VCCCD41HH150J	J 15p	50V Ceramic	AA
C407	VCCCCY1HH330J	J 33p	50V Ceramic	AA
C408	VCCCCY1HH560J	J 56p	50V Ceramic	AA
C410	VCKYCY1HB102K	J 1000p	50V Ceramic	AA
C411	VCKYCY1HB221K	J 220p	50V Ceramic	AA
C412	VCKYCY1HB681K	J 680p	50V Ceramic	AA
C414	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C417	VCCCCY1HH330J	J 33p	50V Ceramic	AA
C418	VCEAEM1HW474M	J 0.47	50V Electrolytic	AB
C419	VCKYCY1HB392K	J 3900p	50V Ceramic	AA
C422	VCKYCY1EB103K	J 0.01	25V Ceramic	AA
C423	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C424	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C425	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C427	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C501	VCKYD41CX332N	J 3300p	16V Ceramic	AA
C502	VCKYCY1HB271K	J 270p	50V Ceramic	AA
C503	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C504	VCEAEM0JW107M	J 100	6.3V Electrolytic	AB
C505	VCKYCY1CB473K	J 0.047	16V Ceramic	AA
C506	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C508	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C509	VCKYCY1EB153K	J 0.015	25V Ceramic	AA
C510	VCEAEM1HW335M	J 3.3	50V Electrolytic	AB
C511	VCCCCY1HH330J	J 33p	50V Ceramic	AA
C512	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C513	VCKYCY1EF104Z	J 0.1	25V Ceramic	AA
C514	VCKYCY1CB333K	J 0.033	16V Ceramic	AA
C515	VCKYCY1CB473K	J 0.047	16V Ceramic	AA
C516	VCEAEM1HW475M	J 4.7	50V Electrolytic	AB
C517	VCCCCY1HH150J	J 15p	50V Ceramic	AA
C518	VCCCCY1HH220J	J 22p	50V Ceramic	AA
C519	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C520	VCEAEM1HW474M	J 0.47	50V Electrolytic	AB
C521	VCKYCY1HF223Z	J 0.022	50V Ceramic	AB
C522	VCKYCY1AF105Z	J 1	10V Ceramic	AC
C523	VCEAEM1CW106M	J 10	16V Electrolytic	AB

Ref. No.	Part No.	★	Description	Code
<b>CAPACITORS (Continued)</b>				
C526	VCCCCY1HH680J	J 68p	50V Ceramic	AA
C527	VCCCCY1HH470J	J 47p	50V Ceramic	AA
C528	VCCCCY1HH560J	J 56p	50V Ceramic	AA
C529	VCEAEM1HW475M	J 4.7	50V Electrolytic	AB
C530	VCCCCY1HH121J	J 120p	50V Ceramic	AA
C531	VCCSD41HL010M	J 1p	50V Ceramic	AA
C532	VCCCCY1HH470J	J 47p	50V Ceramic	AA
C533	VCCCCY1HH470J	J 47p	50V Ceramic	AA
C535	VCCCCY1HH680J	J 68p	50V Ceramic	AA
C536	VCKYCY1HB681K	J 680p	50V Ceramic	AA
C537	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C538	VCCCCY1HH101J	J 100p	50V Ceramic	AA
C541	VCKYCY1CF104Z	J 0.1	16V Ceramic	AA
C550	VCCCCY1HH120J	J 12p	50V Ceramic	AA
C621	VCEAEA1CW476M	J 47	16V Electrolytic	AB
C622	VCKYCY1EB103K	J 0.01	25V Ceramic	AA
C623	VCKYCY1EB103K	J 0.01	25V Ceramic	AA
C624	VCQPYA2AA562J	J 5600p	100V Mylar	AC
C625	VCCSPA1HL221J	J 220p	50V Ceramic	AA
C626	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C702	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C703	VCEAEM1HW105M	J 1	50V Electrolytic	AB
C705	VCFYSA1HB104J	J 0.1	50V Mylar	AB
C709	VCKYD41CY103N	J 0.01	16V Ceramic	AA
C710	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C711	VCEAEM0JW476M	J 47	6.3V Electrolytic	AB
C712	VCKYD41CX682N	J 6800p	16V Ceramic	AA
C715	VCEAEM1CW106M	J 10	16V Electrolytic	AB
C718	VCEAEM1CW226M	J 22	16V Electrolytic	AB
C722	VCCCCY1HH180J	J 18p	50V Ceramic	AA
C724	VCCCCY1HH180J	J 18p	50V Ceramic	AA
C725	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C726	VCCCCY1HH220J	J 22p	50V Ceramic	AA
C727	VCCCCY1HH220J	J 22p	50V Ceramic	AA
C728	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C729	VCKYCY1HB472K	J 4700p	50V Ceramic	AA
C730	VCEAEM0JW336M	J 33	6.3V Electrolytic	AA
C731	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C732	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C733	VCKYCY1HB472K	J 4700p	50V Ceramic	AA
C734	VCEAEM0JW107M	J 100	6.3V Electrolytic	AB
C735	VCEAEM1HW105M	J 1	50V Electrolytic	AB
C736	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C737	VCCCCY1HH470J	J 47p	50V Ceramic	AA
C738	VCCCCY1HH470J	J 47p	50V Ceramic	AA
C739	VCCCCY1HH470J	J 47p	50V Ceramic	AA
C740	VCKYCY1HB102K	J 1000p	50V Ceramic	AA
C741	VCKYCY1HB102K	J 1000p	50V Ceramic	AA
C742	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C743	RC-EZ0425GEZZ	J 0.047F	Electrolytic	AE
C744	VCKYD41HB102K	J 1000p	50V Ceramic	AA
C746	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C747	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C749	VCKYCY1HB102K	J 1000p	50V Ceramic	AA
C750	VCKYCY1HB102K	J 1000p	50V Ceramic	AA

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
<b>CAPACITORS (Continued)</b>					<b>CAPACITORS (Continued)</b>				
C751	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C1510	VCQYTA1HM333J	J	0.033 50V Mylar	AA
C752	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C1511	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C753	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C1515	RC-EZ0459GEZZ	J	Electrolytic	AE
C754	VCE9EM1HW105M	J	1 50V Elect.(N.P.)	AB	C1551	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C755	VCEAEM1CW476M	J	47 16V Electrolytic	AB	C1552	VCEAEA1HW106M	J	10 50V Electrolytic	AB
C756	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C1553	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C758	VCKYCY1HB102K	J	1000p 50V Ceramic	AA	C1554	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C759	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C1555	VCEAEM1CW476M	J	47 16V Electrolytic	AB
C760	VCEAEM1CW476M	J	47 16V Electrolytic	AB	C1556	VCKYPA1HF103Z	J	0.01 50V Ceramic	AA
C761	VCKYCY1HB222K	J	2200p 50V Ceramic	AA	C1557	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C762	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C1560	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C763	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C1561	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C764	VCKYCY1HB102K	J	1000p 50V Ceramic	AA	C2202	VCEAEA1HW335M	J	3.3 50V Electrolytic	AB
C765	VCFYSA1HB334J	J	0.33 50V Mylar	AB	C2401	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C766	VCEAEM1CW476M	J	47 16V Electrolytic	AB	C2402	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C767	VCKYCY1HB102K	J	1000p 50V Ceramic	AA	C2403	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C769	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C2404	VCEAEM1HW105M	J	1 50V Electrolytic	AB
C770	VCFYSA1HB104J	J	0.1 50V Mylar	AB	C2405	VCKYCY1HB102K	J	1000p 50V Ceramic	AA
C771	VCEAEM0JW476M	J	47 6.3V Electrolytic	AB	C2406	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C772	VCKYCY1EB183K	J	0.018 25V Ceramic	AA	C2407	VCFYSA1HB563J	J	0.056 50V Mylar	AA
C774	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C2408	VCEAEM1HW105M	J	1 50V Electrolytic	AB
C780	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C4404	VCEAEM1CW476M	J	47 16V Electrolytic	AB
C781	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C4452	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C782	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C5901	VCCCCY1HH151J	J	150p 50V Ceramic	AA
△ C901	RC-FZ071SGEZZ	J	0.047 250V Mylar	AF	C5902	VCCCCY1HH180J	J	18p 50V Ceramic	AA
△ C904	RC-FZ063SGEZZ	J	0.1 250V Mylar	AE	C5903	VCCCCY1HH151J	J	150p 50V Ceramic	AA
△ C905	RC-KZ0310CEZZ	J	2200p 400V Ceramic	AC	C5905	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
△ C906	RC-KZ0310CEZZ	J	2200p 400V Ceramic	AC	C5906	VCEAEM1HW105M	J	1 50V Electrolytic	AB
△ C907	RC-EZ0437GEZZ	J	68 400V Electrolytic	AK	C5908	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
△ C908	RC-KZ0310CEZZ	J	2200p 400V Ceramic	AC	C5909	VCCCCY1HH6R0D	J	6p 50V Ceramic	AA
△ C909	RC-KZ0310CEZZ	J	2200p 400V Ceramic	AC	C5910	VCCCCY1HH6R0D	J	6p 50V Ceramic	AA
△ C910	VCEAGA2AW106M	J	10 100V Electrolytic	AC	C5911	VCEAEM1AW476M	J	47 10V Electrolytic	AB
△ C911	VCFYZP2GA473K	J	0.047 400V Mylar	AC	C5912	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
△ C912	RC-KZ0037GEZZ	J	220p 2kV Ceramic	AC	C5913	VCCCCY1HH101J	J	100p 50V Ceramic	AA
△ C913	VCFYSA1HB104J	J	0.1 50V Mylar	AB	C5916	VCKYCY1HB102K	J	1000p 50V Ceramic	AA
△ C914	VCFYSA1HB473J	J	0.047 50V Mylar	AA	C5917	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
△ C915	VCFYSA1HB473J	J	0.047 50V Mylar	AA	C5918	VCEAEM1CW107M	J	100 16V Electrolytic	AB
△ C916	VCQYTA1HM222J	J	2200p 50V Mylar	AA	C5921	VCEAEM1CW106M	J	10 16V Electrolytic	AB
△ C924	RC-QZ0104GEZZ	J	2200p 250V Mylar	AC	C5922	VCEAEM1CW106M	J	10 16V Electrolytic	AB
△ C925	RC-EZ0439GEZZ	J	2200 16V Electrolytic	AF	C5923	VCKYCY1HB221K	J	220p 50V Ceramic	AA
△ C926	VCEAGA1CW107M	J	100 16V Electrolytic	AB	C5924	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
△ C927	VCEAGA1JW107M	J	100 63V Electrolytic	AC	C5925	VCEAEA1CW476M	J	47 16V Electrolytic	AB
△ C929	RC-EZ0439GEZZ	J	2200 16V Electrolytic	AF	C5926	VCCCCY1HH101J	J	100p 50V Ceramic	AA
△ C930	VCEAGA1AW477M	J	470 10V Electrolytic	AC	C5927	VCCCCY1HH101J	J	100p 50V Ceramic	AA
△ C931	VCEAGA1HW476M	J	47 50V Electrolytic	AB	C5939	VCEAGA0JW477M	J	470 6.3V Electrolytic	AB
△ C935	VCEAEM1HW105M	J	1 50V Electrolytic	AB	C5950	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
△ C936	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C5951	VCCCCY1HH101J	J	100p 50V Ceramic	AA
△ C937	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C5952	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
△ C951	VCFYSA1HB223J	J	0.022 50V Mylar	AA	C5970	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C952	VCEAEM1CW106M	J	10 16V Electrolytic	AB	C5972	VCCCCY1HH6R0D	J	6p 50V Ceramic	AA
C953	VCEAEM1CW226M	J	22 16V Electrolytic	AB					
C954	VCEAEM1CW226M	J	22 16V Electrolytic	AB					
C955	VCEAEM1AW476M	J	47 10V Electrolytic	AB					
△ C956	VCEAGA1CW477M	J	470 16V Electrolytic	AC					
△ C957	VCEAGA1CW107M	J	100 16V Electrolytic	AB					
					<b>RESISTORS</b>				
					R211	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
					R212	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA

Ref. No.	Part No.	★	Description	Code
<b>RESISTORS (Continued)</b>				
R213	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R214	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R215	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R216	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R217	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R219	VRS-CY1JF122J	J	1.2k 1/16W Metal Oxide	AA
R220	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R224	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R228	VRS-CY1JF271J	J	270 1/16W Metal Oxide	AA
R229	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R230	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R265	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R301	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R303	VRD-RA2BE224J	J	220k 1/8W Carbon	AA
R304	VRS-CY1JF182J	J	1.8k 1/16W Metal Oxide	AA
R305	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R307	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R308	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R309	VRS-CY1JF470J	J	47 1/16W Metal Oxide	AA
R310	VRS-CY1JF470J	J	47 1/16W Metal Oxide	AA
R311	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
R312	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R314	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R315	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
R316	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R317	VRS-CY1JF181J	J	180 1/16W Metal Oxide	AA
R318	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R319	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R320	VRS-CY1JF180J	J	18 1/16W Metal Oxide	AA
R323	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R326	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
R330	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R331	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R332	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R333	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R334	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R341	VRS-CY1JF470J	J	47 1/16W Metal Oxide	AA
R342	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R343	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R344	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R346	VRD-RA2BE822J	J	8.2k 1/8W Carbon	AA
R401	VRS-CY1JF122J	J	1.2k 1/16W Metal Oxide	AA
R402	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R403	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R404	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R405	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R406	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R407	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R408	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R409	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R410	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R411	VRS-CY1JF271J	J	270 1/16W Metal Oxide	AA
R412	VRS-CY1JF821J	J	820 1/16W Metal Oxide	AA
R413	VRS-CY1JF821J	J	820 1/16W Metal Oxide	AA
R414	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA

Ref. No.	Part No.	★	Description	Code
<b>RESISTORS (Continued)</b>				
R415	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R416	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R417	VRS-CY1JF182J	J	1.8k 1/16W Metal Oxide	AA
R418	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R419	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R420	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R421	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R422	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R423	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R424	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R425	VRD-RA2BE272J	J	2.7k 1/8W Carbon	AA
R426	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
R427	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R428	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R429	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
R431	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R432	VRS-CY1JF122J	J	1.2k 1/16W Metal Oxide	AA
R433	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R434	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R435	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
R436	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R438	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R439	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R440	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R441	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide	AA
R442	VRS-CY1JF122J	J	1.2k 1/16W Metal Oxide	AA
R443	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R444	VRS-CY1JF224J	J	220k 1/16W Metal Oxide	AA
R446	VRS-CY1JF105J	J	1M 1/16W Metal Oxide	AA
R447	VRS-CY1JF105J	J	1M 1/16W Metal Oxide	AA
R501	VRS-CY1JF151J	J	150 1/16W Metal Oxide	AA
R502	VRS-CY1JF821J	J	820 1/16W Metal Oxide	AA
R506	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R507	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R508	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R510	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R511	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R513	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R515	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R516	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R517	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R520	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R523	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R525	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R530	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R540	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R547	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R551	VRD-RA2BE123J	J	12k 1/8W Carbon	AA
R565	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R631	VRS-CY1JF470J	J	47 1/16W Metal Oxide	AA
R632	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R633	VRG-SC2EB4R7J	J	4.7 1/4W Fuse Resistor	AB
R635	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R643	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R679	VRD-RA2BE820J	J	82 1/8W Carbon	AA

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
RESISTORS (Continued)					RESISTORS (Continued)				
R701	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA	R766	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R702	VRD-RA2BE562J	J	5.6k 1/8W Carbon	AA	R767	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R704	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA	R769	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R705	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	R771	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R713	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA	R772	VRD-RA2BE223J	J	22k 1/8W Carbon	AA
R714	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA	R773	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R715	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA	R774	VRD-RA2BE334J	J	330k 1/8W Carbon	AA
R716	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA	R775	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R717	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA	R776	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R718	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA	R777	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R719	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA	R778	VRS-CY1JF185J	J	1.8M 1/16W Metal Oxide	AA
R720	VRS-CY1JF564J	J	560k 1/16W Metal Oxide	AA	R779	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R721	VRS-CY1JF224J	J	220k 1/16W Metal Oxide	AA	R781	VRD-RA2BE223J	J	22k 1/8W Carbon	AA
R722	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA	R782	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R723	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA	R784	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R724	VRS-CY1JF684J	J	680k 1/16W Metal Oxide	AA	R785	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R725	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA	R786	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R726	VRS-CY1JF683J	J	68k 1/16W Metal Oxide	AA	R788	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R727	VRS-CY1JF224J	J	220k 1/16W Metal Oxide	AA	R789	VRD-RA2BE331J	J	330 1/8W Carbon	AA
R728	VRS-CY1JF274J	J	270k 1/16W Metal Oxide	AA	R790	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R729	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA	R791	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R730	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA	R792	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R731	VRD-RA2BE182J	J	1.8k 1/8W Carbon	AA	R794	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
R732	VRD-RA2HD680J	J	68 1/2W Carbon	AA	R797	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R733	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA	R801	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
R734	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA	R802	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
R735	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA	R803	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R736	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	R804	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R737	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	R805	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R738	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	R807	VRD-RA2BE104J	J	100k 1/8W Carbon	AA
R739	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA	R810	VRD-RA2BE471J	J	470 1/8W Carbon	AA
R740	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA	R811	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R741	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	R812	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R742	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	R813	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R743	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	R823	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R745	VRD-RA2BE104J	J	100k 1/8W Carbon	AA	R824	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R746	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	R834	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R747	VRD-RA2BE472J	J	4.7k 1/8W Carbon	AA	R837	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R748	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA	R842	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R749	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA	R845	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R750	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	R846	VRS-CY1JF105J	J	1M 1/16W Metal Oxide	AA
R751	VRD-RA2BE154J	J	150k 1/8W Carbon	AA	R847	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R752	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	R848	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R753	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA	R849	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R754	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA	△ R901	VRD-RA2HD105J	J	1M 1/2W Carbon	AA
R755	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	△ R902	RR-WZ0002GEZZ	J	2.2 2W Cement	AD
R756	VRD-RA2EE151J	J	150 1/4W Carbon	AA	△ R903	VRC-UA2HG685K	J	6.8M 1/2W Solid	AA
R757	VRD-RA2BE104J	J	100k 1/8W Carbon	AA	△ R904	VRC-UA2HG685K	J	6.8M 1/2W Solid	AA
R758	VRD-RA2BE271J	J	270 1/8W Carbon	AA	△ R905	VRS-VV3AB104J	J	100k 1W Metal Oxide	AB
R759	VRD-RA2BE104J	J	100k 1/8W Carbon	AA	△ R906	VRS-VV3AB104J	J	100k 1W Metal Oxide	AB
R760	VRD-RA2BE271J	J	270 1/8W Carbon	AA	△ R907	VRD-RA2EE333J	J	33k 1/4W Carbon	AA
R761	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	△ R908	RR-SZ0006GEZZ	J	68k 3W Acid metal	AD
R762	VRG-SC2EB2R2J	J	2.2 1/4W Fuse Resistor	AC	△ R909	RR-SZ0004GEZZ	J	100 2W Acid metal	AB
R764	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA	△ R910	RR-SZ0005GEZZ	J	47 3W Acid metal	AD
R765	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA	△ R911	VRD-RA2EE101J	J	100 1/4W Carbon	AA

Ref. No.	Part No.	★	Description	Code
<b>RESISTORS (Continued)</b>				
△ R912	VRD-RA2EE821J	J 820	1/4W Carbon	AA
△ R921	VRD-RA2HD100J	J 10	1/2W Carbon	AA
△ R923	VRG-SC2EB100J	J 10	1/4W Fuse Resistor	AB
△ R925	VRD-RA2BE221J	J 220	1/8W Carbon	AA
△ R926	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA
△ R927	VRS-CY1JF153J	J 15k	1/16W Metal Oxide	AA
△ R928	VRD-RA2BE221J	J 220	1/8W Carbon	AA
△ R929	VRS-CY1JF221J	J 220	1/16W Metal Oxide	AA
△ R930	VRD-RA2BE272J	J 2.7k	1/8W Carbon	AA
△ R931	VRD-RA2BE272J	J 2.7k	1/8W Carbon	AA
△ R932	VRS-CY1JF392J	J 3.9k	1/16W Metal Oxide	AA
R934	VRS-CY1JF682J	J 6.8k	1/16W Metal Oxide	AA
R952	VRS-CY1JF180J	J 18	1/16W Metal Oxide	AA
R953	VRS-CY1JF823J	J 82k	1/16W Metal Oxide	AA
R954	VRD-RA2HD6R8J	J 6.8	1/2W Carbon	AA
R955	VRD-RA2HD6R8J	J 6.8	1/2W Carbon	AA
R956	VRD-RA2BE1R0J	J 1	1/8W Carbon	AA
R957	VRD-RA2BE1R0J	J 1	1/8W Carbon	AA
R958	VRD-RA2BE1R0J	J 1	1/8W Carbon	AA
R959	VRD-RA2HD561J	J 560	1/2W Carbon	AA
R961	VRS-CY1JF100J	J 10	1/16W Metal Oxide	AA
R962	VRS-CY1JF223J	J 22k	1/16W Metal Oxide	AA
R963	VRD-RA2BE221J	J 220	1/8W Carbon	AA
R964	VRS-CY1JF181J	J 180	1/16W Metal Oxide	AA
R965	VRS-CY1JF563J	J 56k	1/16W Metal Oxide	AA
R966	VRS-CY1JF331J	J 330	1/16W Metal Oxide	AA
R967	VRS-CY1JF391J	J 390	1/16W Metal Oxide	AA
R968	VRS-CY1JF273J	J 27k	1/16W Metal Oxide	AA
R969	VRS-CY1JF470J	J 47	1/16W Metal Oxide	AA
R970	VRS-CY1JF822J	J 8.2k	1/16W Metal Oxide	AA
R971	VRS-CY1JF470J	J 47	1/16W Metal Oxide	AA
R972	VRS-CY1JF100J	J 10	1/16W Metal Oxide	AA
R973	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA
R974	VRD-RA2BE271J	J 270	1/8W Carbon	AA
R975	VRD-RA2BE1R0J	J 1	1/8W Carbon	AA
R976	VRD-RA2BE1R0J	J 1	1/8W Carbon	AA
R977	VRD-RA2BE1R0J	J 1	1/8W Carbon	AA
R978	VRD-RA2HD561J	J 560	1/2W Carbon	AA
R979	VRD-RA2HD561J	J 560	1/2W Carbon	AA
△ R980	VRG-SC2EBR47J	J 0.47	1/4W Fuse Resistor	AB
R1501	VRS-CY1JF822J	J 8.2k	1/16W Metal Oxide	AA
R1502	VRD-RA2BE392J	J 3.9k	1/8W Carbon	AA
R1510	VRD-RA2BE182J	J 1.8k	1/8W Carbon	AA
R1551	VRS-CY1JF472J	J 4.7k	1/16W Metal Oxide	AA
R1552	VRS-CY1JF474J	J 470k	1/16W Metal Oxide	AA
R1553	VRS-CY1JF101J	J 100	1/16W Metal Oxide	AA
R1554	VRS-CY1JF472J	J 4.7k	1/16W Metal Oxide	AA
R2401	VRD-RA2BE392J	J 3.9k	1/8W Carbon	AA
R2402	VRD-RA2BE681J	J 680	1/8W Carbon	AA
R2403	VRD-RA2BE154J	J 150k	1/8W Carbon	AA
R2404	VRD-RA2BE273J	J 27k	1/8W Carbon	AA
R2405	VRD-RA2BE273J	J 27k	1/8W Carbon	AA
R2406	VRD-RA2BE272J	J 2.7k	1/8W Carbon	AA
R2407	VRS-CY1JF102J	J 1k	1/16W Metal Oxide	AA
R2408	VRD-RA2BE155J	J 1.5M	1/8W Carbon	AA

Ref. No.	Part No.	★	Description	Code
<b>RESISTORS (Continued)</b>				
R2409	VRD-RA2BE224J	J 220k	1/8W Carbon	AA
R2410	VRD-RA2BE684J	J 680k	1/8W Carbon	AA
R2411	VRD-RA2BE154J	J 150k	1/8W Carbon	AA
R4401	VRD-RA2BE151J	J 150	1/8W Carbon	AA
R5904	VRD-RA2BE391J	J 390	1/8W Carbon	AA
R5905	VRD-RA2BE153J	J 15k	1/8W Carbon	AA
R5906	VRD-RA2BE103J	J 10k	1/8W Carbon	AA
R5908	VRD-RA2EE181J	J 180	1/4W Carbon	AA
R5909	VRS-CY1JF332J	J 3.3k	1/16W Metal Oxide	AA
R5910	VRD-RA2EE151J	J 150	1/4W Carbon	AA
R5924	VRS-CY1JF122J	J 1.2k	1/16W Metal Oxide	AA
R5925	VRS-CY1JF332J	J 3.3k	1/16W Metal Oxide	AA
R5950	VRS-CY1JF104J	J 100k	1/16W Metal Oxide	AA
R5963	VRS-CY1JF101J	J 100	1/16W Metal Oxide	AA
R5970	VRD-RA2BE272J	J 2.7k	1/8W Carbon	AA

**MISCELLANEOUS PARTS**

△	QACCV2005AJZZ	V	AC Cord (VC-ML3)	AM
△	QACCB5010GEZZ	J	AC Cord (VC-ML3W)	AU
△	F901	J	QFS-C2023CEZZ Fuse, T2AL/250V	AD
	FB701	J	RBLN-0043CEZZ Balun	AB
	FB1501	J	RBLN-0043CEZZ Balun	AB
△	FH901	J	QFSDH1010CEZZ Fuse Holder	AA
△	FH902	J	QFSDH1009CEZZ Fuse Holder	AA
	P201	J	QPLGN0278GEZZ Plug, 2pin	AA
	P203	J	QPLGN0759REZZ Plug, 7pin	AC
	P204	J	QPLGN0378GEZZ Plug, 3pin	AB
	P401	J	QPLGN0347REZZ Plug, 3pin	AA
	P501	J	QPLGN0347REZZ Plug, 3pin	AA
	P601	J	QPLGN0247REZZ Plug, 2pin	AA
	P603	J	QPLGN0578GEZZ Plug, 5pin	AB
	P701	J	QPLGZ0974GEZZ Plug, 9pin	AD
	P702	J	QPLGN0247REZZ Plug, 2pin	AA
	P704	J	QPLGN0278GEZZ Plug, 2pin	AA
△	P901	J	QPLGN0269GEZZ Plug, 2pin	AB
	P4401	J	QPLGN0859REZZ Plug, 8pin	AG
	P4402	J	QPLGZ0531GEZZ Plug, 5pin	AC
	P4403	J	QPLGZ1231GEZZ Plug, 12pin	AB
	P4404	J	QPLGZ1231GEZZ Plug, 12pin	AB
	P4405	J	QPLGZ0831GEZZ Plug, 8pin	AD
	P5901	J	QPLGN1178GEZZ Plug, 11pin	AC
	SC301	J	QSOCN1194REZZ Socket, 11pin	AF
	SC302	J	QSOCN0884REZZ Socket, 8pin	AC
	SC303	J	QSOCN0884REZZ Socket, 8pin	AC
	SC601	J	QSOGN0604REN1 Socket, 6pin	AB
	SC701	J	QSOCN0704REN1 Socket, 7pin	AB
	SC702	J	QSOCN0704REN1 Socket, 7pin	AB
	TP601	J	QPLGZ0252GEZZ Plug, 2pin	AA
	TP701	J	QPLGN0247REZZ Plug, 2pin	AA
	TP1551	J	QPLGN0447REZZ Plug, 4pin	AA

— End of Main —

Ref. No.	Part No.	★	Description	Code
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## DUNTK5350XM50 OPERATION UNIT

### INTEGRATED CIRCUITS

IC5001	VHIUPD16312-1	J	UPD16312	AQ
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### TRANSISTORS

Q5001	VSDTA114ES/-1	J	DTA114ES	AB
Q5002	VSDTA114ES/-1	J	DTA114ES	AB

### DIODES

D5001	VHD1SS119//1	J	1SS119	AB
D5002	VHD1SS119//1	J	1SS119	AB
D5003	VHD1SS119//1	J	1SS119	AB
D5004	VHD1SS119//1	J	1SS119	AB
D5006	RH-PX0204GEZZ	J	Photo Diode	AB
D5007	RH-PX0268CEZZ	J	Photo Diode	AC
D5008	RH-PX0216GEZZ	J	Photo Diode	AB
D5010	VHD1SS119//1	J	1SS119	AB

### CONTROLS

R5050	RVR-B4373GEZZ	J		AD
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### CAPACITORS

C5003	VCKYD41HB561K	J	560p 50V Ceramic	AA
C5005	VCEAEA1CW226M	J	22 16V Electrolytic	AB
C5008	VGEAEA1CW476M	J	47 16V Electrolytic	AB
C5009	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C5015	VCKYD41HB221K	J	220p 50V Ceramic	AA
C5016	VCKYD41HB221K	J	220p 50V Ceramic	AA

### RESISTORS

R5001	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA
R5002	VRD-RA2BE123J	J	12k 1/8W Carbon	AA
R5003	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R5004	VRD-RA2BE472J	J	4.7k 1/8W Carbon	AA
R5005	VRS-CY1JF221J	J	220 1/16W Metal Oxide	AA
R5006	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R5008	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R5009	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R5010	VRD-RA2BE331J	J	330 1/8W Carbon	AA
R5011	VRD-RA2BE472J	J	4.7k 1/8W Carbon	AA
R5012	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R5013	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R5014	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R5015	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R5051	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA
R5052	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA
R5053	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA

Ref. No.	Part No.	★	Description	Code
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### RESISTORS (Continued)

R5054	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R5055	VRS-CY1JF750J	J	75 1/16W Metal Oxide	AA

### MISCELLANEOUS PARTS

J5001	QJAKG0020GEZZ	J	Jack	AF
J5002	QJAKE0043GEZZ	J	Jack	AD
P5001	QPLGN0580GEZZ	J	Plug, 5pin	AB
P5002	QPLGN0578GEZZ	J	Plug, 5pin	AB
RMC5001	RRMCU0052GEZZ	J	R/C Receiver	AK
S5002	QSW-K0094GEZZ	J	Switch	AC
S5003	QSW-K0094GEZZ	J	Switch	AC
S5004	QSW-K0095GEZZ	J	Switch	AC
S5006	QSW-K0095GEZZ	J	Switch	AC
S5007	QSW-K0094GEZZ	J	Switch	AC
S5009	QSW-K0095GEZZ	J	Switch	AC
S5012	QSW-K0094GEZZ	J	Switch	AC
S5014	QSW-K0094GEZZ	J	Switch	AC
S5015	QSW-K0094GEZZ	J	Switch	AC
S5016	QSW-Z0001AJZZ	V	Switch	AQ
SC5001	QSOCN0704REN1	J	Socket, 7pin	AB
SC5003	QSOCN0403REN1	J	Socket, 4pin	AD
TP5001	QPLGN0247REZZ	J	Plug, 2pin	AA
TP5005	QPLGN0247REZZ	J	Plug, 2pin	AA

— End of Operation Unit —

## DUNTK5354XM50 REC TIP UNIT

### MISCELLANEOUS PARTS

P801	QPLGN0278GEZZ	J	Plug, 2pin (EF)	AA
S701	QSW-F0042AJZZ	J	Rec Tip Switch	AG

— End of Rec Tip Unit —

Ref. No.	Part No.	★	Description	Code
<b>DUNTK5356XM50</b>				
<b>Hi-Fi UNIT</b>				

**INTEGRATED CIRCUITS**

IC6301	VHIAN3965F/-1	J	AN3965F	AV
IC6302	VHIBA7755AF1E	J	BA7755AF	AE
IC6504	VHIM5222FP/-1	J	M5222FP	AG
IC6505	VHIBA15218F1E	J	BA15218F	AF

**TRANSISTORS**

Q6302	VSDTC144EK/-1	J	DTC144EK	AB
Q6305	VSDTA124EK/-1	J	DTA124EK	AB
Q6306	VSDTC363TK/-1	J	DTC363TK	AB
Q6307	VSDTC363TK/-1	J	DTC363TK	AB
Q6308	VSDTC363TK/-1	J	DTC363TK	AB
Q6311	VSDTC144EK/-1	J	DTC144EK	AB
Q6312	VSDTC124EK/-1	J	DTC124EK	AB
Q6315	VSDTC144EK/-1	J	DTC144EK	AB
Q6316	VSDTC363TK/-1	J	DTC363TK	AB
Q6317	VSDTC114EK/-1	J	DTC114EK	AB
Q6318	VSDTC144EK/-1	J	DTC144EK	AB
Q6321	VSDTC144EK/-1	J	DTC144EK	AB
Q6323	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q6504	VSDTA124EK/-1	J	DTA124EK	AB
Q6507	VSDTC363TK/-1	J	DTC363TK	AB
Q6508	VSDTC363TK/-1	J	DTC363TK	AB
Q6511	VS2C1740SQR1E	J	2SC1740SQR	AC

**DIODES**

D6309	VHD1SS119//1	J	1SS119	AB
D6501	RH-EX0634GEZZ	J	Zener Diode	AA

**COILS AND TRANSFORMERS**

L6301	VP-2K680K000K	J	68μH	AB
L6303	VP-YF822J0000	J	8200μH	AC

**CONTROLS**

R6308	RVR-M4498CEZZ	J	22k (B), PAL Adj.	AD
R6310	RVR-M4496CEZZ	J	10k (B), NTSC Adj.	AD
R6363	RVR-M4496CEZZ	J	10k (B), NTSC Adj.	AD
R6365	RVR-M4500CEZZ	J	47k (B), PAL Adj.	AF

**CAPACITORS**

C6301	VCCCCY1HH101J	J	100p 50V Ceramic	AA
C6304	VCEAEM1HW225M	J	2.2 50V Electrolytic	AB
C6305	VCKYCY1EB103K	J	0.01 25V Ceramic	AA
C6306	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C6307	VCCCCY1HH560J	J	56p 50V Ceramic	AA
C6308	VCCCCY1HH560J	J	56p 50V Ceramic	AA

Ref. No.	Part No.	★	Description	Code
<b>CAPACITORS (Continued)</b>				
C6309	VCKYCY1EB103K	J	0.01 25V Ceramic	AA
C6310	VCKYCY1EB103K	J	0.01 25V Ceramic	AA
C6311	VCFYSA1HB153J	J	0.015 50V Mylar	AA
C6312	VCEAEM0JW107M	J	100 6.3V Electrolytic	AB
C6313	VCEAEM1HW225M	J	2.2 50V Electrolytic	AB
C6314	VCEAEM1CW336M	J	33 16V Electrolytic	AB
C6315	VCKYCY1CB473K	J	0.047 16V Ceramic	AA
C6316	VCKYCY1AF105Z	J	1 10V Ceramic	AC
C6318	VCKYCY1AF105Z	J	1 10V Ceramic	AC
C6320	VCKYCY1CF334Z	J	0.33 16V Ceramic	AA
C6322	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB
C6323	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C6324	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C6325	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C6326	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C6327	VCEAEM1CW226M	J	22 16V Electrolytic	AB
C6328	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C6329	VCCCCY1HH560J	J	56p 50V Ceramic	AA
C6330	VCEAEA1HW335M	J	3.3 50V Electrolytic	AB
C6331	VCFYSA1HB153J	J	0.015 50V Mylar	AA
C6332	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C6333	VCKYCY1HB681K	J	680p 50V Ceramic	AA
C6334	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C6337	VCFYSA1HB223J	J	0.022 50V Mylar	AA
C6338	VCKYCY1HB682K	J	6800p 50V Ceramic	AA
C6339	VCKYCY1HB682K	J	6800p 50V Ceramic	AA
C6340	VCKYCY1HB222K	J	2200p 50V Ceramic	AA
C6341	VCKYCY1AF105Z	J	1 10V Ceramic	AC
C6342	VCKYCY1HB182K	J	1800p 50V Ceramic	AA
C6343	VCKYCY1HB332K	J	3300p 50V Ceramic	AA
C6344	VCCCCY1HH181J	J	180p 50V Ceramic	AA
C6345	VCEAEA1HW224M	J	0.22 50V Electrolytic	AB
C6349	VCEAEM1HW475M	J	4.7 50V Electrolytic	AB
C6350	VCKYCY1CF334Z	J	0.33 16V Ceramic	AA
C6352	VCKYCY1AF105Z	J	1 10V Ceramic	AC
C6354	VCKYCY1AF105Z	J	1 10V Ceramic	AC
C6356	VCKYCY1CF334Z	J	0.33 16V Ceramic	AA
C6357	VCKYCY1CB473K	J	0.047 16V Ceramic	AA
C6358	VCEAEM1CW336M	J	33 16V Electrolytic	AB
C6359	VCEAEM1HW225M	J	2.2 50V Electrolytic	AB
C6360	VCEAEM0JW107M	J	100 6.3V Electrolytic	AB
C6361	VCFYSA1HB153J	J	0.015 50V Mylar	AA
C6362	VCKYCY1EB103K	J	0.01 25V Ceramic	AA
C6376	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C6385	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C6388	VCKYCY1HB471K	J	470p 50V Ceramic	AA
C6389	VCKYCY1HB471K	J	470p 50V Ceramic	AA
C6390	VCKYCY1HB471K	J	470p 50V Ceramic	AA
C6391	VCKYCY1HB471K	J	470p 50V Ceramic	AA
C6392	VCKYCY1HB392K	J	3900p 50V Ceramic	AA
C6393	VCKYCY1HB392K	J	3900p 50V Ceramic	AA
C6524	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C6525	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C6526	VCKYCY1CF224Z	J	0.22 16V Ceramic	AA
C6527	VCEAEA1CW106M	J	10 16V Electrolytic	AB



Ref. No.	Part No.	★	Description	Code
<b>CAPACITORS (Continued)</b>				
C6528	VCEAEM1CW106M	J 10	16V Electrolytic	AB
C6529	VCCCCY1HH181J	J 180p	50V Ceramic	AA
C6530	VCEAGA1AW107M	J 100	10V Electrolytic	AB
C6531	VCEAEA1AW107M	J 100	10V Electrolytic	AB
C6532	VCCCCY1HH181J	J 180p	50V Ceramic	AA
C6533	VCEAEM1CW106M	J 10	16V Electrolytic	AB
C6536	VCCCCY1HH101J	J 100p	50V Ceramic	AA
C6537	VCCCCY1HH101J	J 100p	50V Ceramic	AA
C6538	VCCCCY1HH101J	J 100p	50V Ceramic	AA
C6539	VCCCCY1HH101J	J 100p	50V Ceramic	AA
C6540	VCKYCY1CF104Z	J 0.1	16V Ceramic	AA
C6545	VCEAEA1CW106M	J 10	16V Electrolytic	AB
C6546	VCEAEA1CW476M	J 47	16V Electrolytic	AB

**RESISTORS**

R6303	VRS-CY1JF101J	J 100	1/16W Metal Oxide	AA
R6306	VRS-CY1JF331J	J 330	1/16W Metal Oxide	AA
R6307	VRS-CY1JF331J	J 330	1/16W Metal Oxide	AA
R6309	VRS-CY1JF151J	J 150	1/16W Metal Oxide	AA
R6311	VRD-RA2BE153J	J 15k	1/8W Carbon	AA
R6312	VRS-CY1JF392J	J 3.9k	1/16W Metal Oxide	AA
R6313	VRS-CY1JF123J	J 12k	1/16W Metal Oxide	AA
R6314	VRD-RA2BE393J	J 39k	1/8W Carbon	AA
R6315	VRS-CY1JF223J	J 22k	1/16W Metal Oxide	AA
R6317	VRD-RA2BE393J	J 39k	1/8W Carbon	AA
R6318	VRS-CY1JF223J	J 22k	1/16W Metal Oxide	AA
R6320	VRS-CY1JF472J	J 4.7k	1/16W Metal Oxide	AA
R6321	VRS-CY1JF471J	J 470	1/16W Metal Oxide	AA
R6322	VRS-CY1JF821J	J 820	1/16W Metal Oxide	AA
R6323	VRS-CY1JF473J	J 47k	1/16W Metal Oxide	AA
R6324	VRS-CY1JF821J	J 820	1/16W Metal Oxide	AA
R6325	VRS-CY1JF473J	J 47k	1/16W Metal Oxide	AA
R6326	VRS-CY1JF821J	J 820	1/16W Metal Oxide	AA
R6327	VRS-CY1JF473J	J 47k	1/16W Metal Oxide	AA
R6328	VRS-CY1JF333J	J 33k	1/16W Metal Oxide	AA
R6329	VRS-CY1JF223J	J 22k	1/16W Metal Oxide	AA
R6331	VRS-CY1JF223J	J 22k	1/16W Metal Oxide	AA
R6332	VRS-CY1JF181J	J 180	1/16W Metal Oxide	AA
R6333	VRS-CY1JF562J	J 5.6k	1/16W Metal Oxide	AA
R6337	VRS-CY1JF391J	J 390	1/16W Metal Oxide	AA
R6338	VRD-RA2BE221J	J 220	1/8W Carbon	AA
R6339	VRS-CY1JF181J	J 180	1/16W Metal Oxide	AA
R6341	VRS-CY1JF562J	J 5.6k	1/16W Metal Oxide	AA
R6342	VRS-CY1JF472J	J 4.7k	1/16W Metal Oxide	AA
R6343	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA
R6344	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA
R6345	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA
R6346	VRD-RA2BE153J	J 15k	1/8W Carbon	AA
R6347	VRS-CY1JF472J	J 4.7k	1/16W Metal Oxide	AA
R6348	VRS-CY1JF562J	J 5.6k	1/16W Metal Oxide	AA
R6349	VRS-CY1JF682J	J 6.8k	1/16W Metal Oxide	AA
R6350	VRS-CY1JF223J	J 22k	1/16W Metal Oxide	AA
R6351	VRS-CY1JF472J	J 4.7k	1/16W Metal Oxide	AA
R6352	VRS-CY1JF335J	J 3.3M	1/16W Metal Oxide	AA

Ref. No.	Part No.	★	Description	Code
<b>RESISTORS (Continued)</b>				
R6354	VRS-CY1JF223J	J 22k	1/16W Metal Oxide	AA
R6355	VRD-RA2BE393J	J 39k	1/8W Carbon	AA
R6356	VRS-CY1JF223J	J 22k	1/16W Metal Oxide	AA
R6357	VRD-RA2BE393J	J 39k	1/8W Carbon	AA
R6358	VRS-CY1JF471J	J 470	1/16W Metal Oxide	AA
R6359	VRS-CY1JF472J	J 4.7k	1/16W Metal Oxide	AA
R6360	VRS-CY1JF123J	J 12k	1/16W Metal Oxide	AA
R6361	VRS-CY1JF392J	J 3.9k	1/16W Metal Oxide	AA
R6362	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA
R6364	VRS-CY1JF152J	J 1.5k	1/16W Metal Oxide	AA
R6371	VRS-CY1JF104J	J 100k	1/16W Metal Oxide	AA
R6372	VRS-CY1JF104J	J 100k	1/16W Metal Oxide	AA
R6378	VRS-CY1JF224J	J 220k	1/16W Metal Oxide	AA
R6389	VRS-CY1JF562J	J 5.6k	1/16W Metal Oxide	AA
R6390	VRS-CY1JF272J	J 2.7k	1/16W Metal Oxide	AA
R6391	VRS-CY1JF562J	J 5.6k	1/16W Metal Oxide	AA
R6392	VRS-CY1JF272J	J 2.7k	1/16W Metal Oxide	AA
R6393	VRS-CY1JF472J	J 4.7k	1/16W Metal Oxide	AA
R6394	VRD-RA2BE333J	J 33k	1/8W Carbon	AA
R6396	VRS-CY1JF154J	J 150k	1/16W Metal Oxide	AA
R6521	VRS-CY1JF473J	J 47k	1/16W Metal Oxide	AA
R6522	VRD-RA2BE333J	J 33k	1/8W Carbon	AA
R6523	VRS-CY1JF473J	J 47k	1/16W Metal Oxide	AA
R6524	VRS-CY1JF104J	J 100k	1/16W Metal Oxide	AA
R6525	VRS-CY1JF104J	J 100k	1/16W Metal Oxide	AA
R6526	VRS-CY1JF822J	J 8.2k	1/16W Metal Oxide	AA
R6527	VRS-CY1JF332J	J 3.3k	1/16W Metal Oxide	AA
R6528	VRS-CY1JF473J	J 47k	1/16W Metal Oxide	AA
R6529	VRS-CY1JF101J	J 100	1/16W Metal Oxide	AA
R6530	VRS-CY1JF101J	J 100	1/16W Metal Oxide	AA
R6531	VRS-CY1JF473J	J 47k	1/16W Metal Oxide	AA
R6532	VRS-CY1JF332J	J 3.3k	1/16W Metal Oxide	AA
R6533	VRS-CY1JF822J	J 8.2k	1/16W Metal Oxide	AA
R6537	VRS-CY1JF750J	J 75	1/16W Metal Oxide	AA
R6538	VRD-RA2BE271J	J 270	1/8W Carbon	AA
R6539	VRD-RA2BE271J	J 270	1/8W Carbon	AA

**MISCELLANEOUS PARTS**

J6301	QJAKL0008GEZZ	J Jack	AQ
P6301	QPLGN0578GEZZ	J Plug, 5pin	AB
P6302	QPLGN0578GEZZ	J Plug, 5pin	AB
P6303	QPLGN0478GEZZ	J Plug, 4pin	AB
SC6301	QSOCZ0531GEZZ	J Socket, 5pin	AD
SC6302	QSOCZ1231GEZZ	J Socket, 12pin	AC
SC6303	QSOCZ1231GEZZ	J Socket, 12pin	AC
SC6304	QSOCZ0831GEZZ	J Socket, 8pin	AE

— End of Hi-Fi Unit —

Ref. No.	Part No.	★	Description	Code
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## DUNTK5357XM50 MPX UNIT

### INTEGRATED CIRCUITS

IC1701	VHISA7283G2-1	J	SA7283G2	BM
IC1901	RH-IX0055GEZZ	J	IX0055GE	AG
IC1902	VHITDA9840T-1	J	TDA9840T	AS
IC5402	VHiMM1115XF1E	J	MM1115XF	AH
IC5403	VHITL8828P/-1	J	TL8828P	AL

### TRANSISTORS

Q1701	VS2SC2735//1E	J	2SC2735	AC
Q1702	VS2SA950-Y/1E	J	2SA950-Y	AD
Q1703	VSDTC124EK/-1	J	DTC124EK	AB
Q1901	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q1902	VS2C1740SQR1E	J	2SC1740SQR	AC
Q5401	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q5402	VSDTC124EK/-1	J	DTC124EK	AB
Q5403	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q5404	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q5405	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q5406	VS2SC2412KQ-1	J	2SC2412KQ	AA

### DIODES

D1701	VHD1SS119//1	J	1SS119	AB
D1720	VHDOF4076//1	J	OF4076	AC
TH5401	RH-HZ0031GEZZ	J	Thermistor	AB

### PACKAGED CIRCUIT

X1701	RCRSB0183GEZZ	J	Crystal, 8.192MHz	AM
X1901	RCRSB0174GEZZ	J	Crystal, 10MHz	AF
X5403	RCRSB0111GEZZ	J	Crystal, 13.571MHz	AG

### COILS AND TRANSFORMERS

CF1901	RFILC0063CEZZ	J	Filter	AG
L1701	VP-2K6R8K000K	J	6.8μH	AB
L1702	VP-2K6R8K000K	J	6.8μH	AB
L1704	VP-XF6R8K0000	J	6.8μH	AB
L1706	VP-2K6R8K000K	J	6.8μH	AB
L1901	VP-DF101K0000	J	100μH	AB
L1902	VP-DF221K0000	J	220μH	AB
L1903	VP-XF101K0000	J	100μH	AB
L5403	VP-DF680K0000	J	68μH	AB
L5406	VP-XF470J0000	J	47μH	AB
L5407	VP-XF330K0000	J	33μH	AB
L5408	VP-DF6R8K0000	J	6.8μH	AB
L5409	VP-DF101K0000	J	100μH	AB
L5412	VP-ZK100K0000	J	10μH	AB
T1901	RCiLi0089GEZZ	J	Coil	AD
T1902	RCiLi0489CEZZ	J	Coil	AE

Ref. No.	Part No.	★	Description	Code
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### CONTROLS

R1961	RVR-M4809GEZZ	J	4.7k (B), Sub CH Level Adj.	AC
R5410	RVR-M4803GEZZ	J	470k (B)	AC

### CAPACITORS

C1701	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C1702	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C1704	VCCCCY1HH391J	J	390p 50V Ceramic	AA
C1705	VCCCCY1HH100D	J	10p 50V Ceramic	AA
C1706	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C1707	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C1708	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C1709	VCEAEA1HW105M	J	1 50V Electrolytic	AB
C1710	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C1713	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C1716	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C1717	VCEAEA1HW105M	J	1 50V Electrolytic	AB
C1718	VCFYSA1HB473J	J	0.047 50V Mylar	AA
C1720	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C1721	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C1722	VCEAEM0JW476M	J	47 6.3V Electrolytic	AB
C1723	VCCCCY1HH221J	J	220p 50V Ceramic	AA
C1724	VCFYSA1HB104J	J	0.1 50V Mylar	AB
C1725	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C1726	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C1727	VCEAEA1HW105M	J	1 50V Electrolytic	AB
C1728	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C1729	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C1730	VCEAEA1HW334M	J	0.33 50V Electrolytic	AB
C1731	VCFYSA1HB223J	J	0.022 50V Mylar	AA
C1732	VCCCPA1HH101J	J	100p 50V Ceramic	AA
C1733	VCCCPA1HH101J	J	100p 50V Ceramic	AA
C1734	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C1735	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C1736	VCEAEA1HW474M	J	0.47 50V Electrolytic	AB
C1737	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C1738	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C1739	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C1740	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB
C1748	VCEAEM0JW476M	J	47 6.3V Electrolytic	AB
C1749	VCEAEM1AW336M	J	33 10V Electrolytic	AB
C1906	VCCCCY1HH100D	J	10p 50V Ceramic	AA
C1907	VCCCCY1HH100D	J	10p 50V Ceramic	AA
C1908	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C1909	VCEAEM0JW227M	J	220 6.3V Electrolytic	AB
C1910	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C1911	VCKYCY1EB103K	J	0.01 25V Ceramic	AA
C1912	VCFYSA1HB104J	J	0.1 50V Mylar	AB
C1913	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C1914	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C1915	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C1916	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C1917	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C1918	VQQYTA1HM103J	J	0.01 50V Mylar	AA
C1919	VQQYTA1HM103J	J	0.01 50V Mylar	AA

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
<b>CAPACITORS (Continued)</b>					<b>RESISTORS (Continued)</b>				
C1920	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	R1716	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
C1921	VCEAEA1AW476M	J	47 10V Electrolytic	AB	R1719	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
C1930	VCEAEA1CW106M	J	10 16V Electrolytic	AB	R1721	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
C1931	VCEAEA1CW106M	J	10 16V Electrolytic	AB	R1909	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
C1939	VCCSD41HL100J	J	10p 50V Ceramic	AA	R1913	VRS-CY1JF331J	J	330 1/16W Metal Oxide	AA
C1940	VCCSD41HL100J	J	10p 50V Ceramic	AA	R1914	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
C1951	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	R1915	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide	AA
C1952	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	R1916	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
C1953	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	R1918	VRS-CY1JF331J	J	330 1/16W Metal Oxide	AA
C1954	VCKYCY1EB103K	J	0.01 25V Ceramic	AA	R1920	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
C1955	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	R1922	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
C1956	VCEAEA1CW106M	J	10 16V Electrolytic	AB	R1951	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
C1957	VCCCCY1HH120J	J	12p 50V Ceramic	AA	R1952	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
C1958	VCKYCY1HB562K	J	5600p 50V Ceramic	AA	R1953	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
C5401	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	R1954	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
C5402	VCEAEM1CW106M	J	10 16V Electrolytic	AB	R1955	VRS-CY1JF331J	J	330 1/16W Metal Oxide	AA
C5403	VCCCCY1HH180J	J	18p 50V Ceramic	AA	R1956	VRS-CY1JF4R7J	J	4.7 1/16W Metal Oxide	AA
C5404	VCCCCY1HH101J	J	100p 50V Ceramic	AA	R1957	VRS-CY1JF151J	J	150 1/16W Metal Oxide	AA
C5405	VCCCCY1HH331J	J	330p 50V Ceramic	AA	R1958	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
C5406	VCCCCY1HH151J	J	150p 50V Ceramic	AA	R1960	VRS-CY1JF182J	J	1.8k 1/16W Metal Oxide	AA
C5407	VCEAEM1CW476M	J	47 16V Electrolytic	AB	R1963	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
C5408	VCEAEA1HW105M	J	1 50V Electrolytic	AB	R5401	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
C5409	VCEAEM1HW105M	J	1 50V Electrolytic	AB	R5402	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide	AA
C5410	VCEAEM1CW226M	J	22 16V Electrolytic	AB	R5404	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
C5411	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	R5405	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
C5412	VCEAEM1CW106M	J	10 16V Electrolytic	AB	R5406	VRS-CY1JF100J	J	10 1/16W Metal Oxide	AA
C5413	VCCCCY1HH180J	J	18p 50V Ceramic	AA	R5407	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
C5414	VCCCCY1HH680J	J	68p 50V Ceramic	AA	R5409	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
C5415	VCCCCY1HH180J	J	18p 50V Ceramic	AA	R5411	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
C5416	VCEAEM0JW107M	J	100 6.3V Electrolytic	AB	R5412	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
C5417	VCCCCY1HH150J	J	15p 50V Ceramic	AA	R5413	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
C5418	VCEAEA1HW474M	J	0.47 50V Electrolytic	AB	R5414	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
C5419	VCEAEM1CW106M	J	10 16V Electrolytic	AB	R5415	VRS-CY1JF391J	J	390 1/16W Metal Oxide	AA
C5420	VCCCCY1HH120J	J	12p 50V Ceramic	AA	R5416	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
C5424	VCE9EA1HW105M	J	1 50V Elect.(N.P.)	AC	R5417	VRS-CY1JF221J	J	220 1/16W Metal Oxide	AA
C5425	VCEAEM1CW107M	J	100 16V Electrolytic	AB	R5418	VRS-CY1JF182J	J	1.8k 1/16W Metal Oxide	AA
C5426	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	R5419	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
C5427	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	R5420	VRS-CY1JF821J	J	820 1/16W Metal Oxide	AA
C5428	VCCCCY1HH100D	J	10p 50V Ceramic	AA	R5421	VRD-RA2EE681J	J	680 1/4W Carbon	AA
C5429	VCFYSA1HB104J	J	0.1 50V Mylar	AB	R5422	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
					R5423	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
					R5425	VRS-CY1JF335J	J	3.3M 1/16W Metal Oxide	AA
<b>RESISTORS</b>					<b>MISCELLANEOUS PARTS</b>				
R1701	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA	P1701	QPLGN0478GEZZ	J	Plug, 4pin	AB
R1702	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA	SC1701	QSOCN0809REN1	J	Socket, 8pin	AC
R1703	VRS-CY1JF331J	J	330 1/16W Metal Oxide	AA	SC1981	QSOCN2407REN1	J	Socket, 24pin	AE
R1704	VRS-CY1JF100J	J	10 1/16W Metal Oxide	AA	SC1982	QSOCN1838TAZZ	J	Socket, 18pin	AF
R1705	VRS-CY1JF151J	J	150 1/16W Metal Oxide	AA	SC1983	QSOCN0786TAZZ	J	Socket, 7pin	AC
R1706	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA	SC5401	QSOCN0709REN1	J	Socket, 7pin	AC
R1707	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA	TP1701	QLUGP0101GEFW	J	Test Point	AA
R1710	VRS-CY1JF182J	J	1.8k 1/16W Metal Oxide	AA	TP1703	QLUGP0101GEFW	J	Test Point	AA
R1711	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA					
R1712	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA					
R1713	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA					
R1714	VRS-CY1JF105J	J	1M 1/16W Metal Oxide	AA					
R1715	VRS-CY1JF684J	J	680k 1/16W Metal Oxide	AA					

— End of MPX Unit —

Ref. No.	Part No.	★	Description	Code
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## DUNTK5359XM50

### LCD UNIT

#### INTEGRATED CIRCUITS

IC8901	VHIR3Y29AP-1	J	IR3Y29AP	AU
IC9001	VHILZ95NA1M-1	J	LZ95NA1M	AP
IC9002	VHINJM2107F-1	J	NJM2107F	AE
IC9060	VHINJM4565V-1	J	NJM4565	AF
IC9101	VHIBA15218F1E	J	BA15218F	AF
IC9102	VHIBA15218F1E	J	BA15218F	AF
IC9103	VHIPQ30RV11-1	J	PQ30RV11	AF

#### TRANSISTORS

Q8901	VSDTC124EK/-1	J	DTC124EK	AB
Q8905	VSDTC144EK/-1	J	DTC144EK	AB
Q8912	VSDTC144EK/-1	J	DTC144EK	AB
Q8913	VSDTA144EK/-1	J	DTA144EK	AC
Q8920	VSDTC144EK/-1	J	DTC144EK	AB
Q8930	VSDTA124EK/-1	J	DTA124EK	AB
Q8931	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q8932	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q8980	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q8985	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q9001	VSDTC144EK/-1	J	DTC144EK	AB
Q9061	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q9062	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q9101	VSDTC114EK/-1	J	DTC114EK	AB
Q9102	VSDTC114EK/-1	J	DTC114EK	AB
Q9103	VS2SA1015Y1E	J	2SA1015Y	AC
Q9104	VSDTA114EK/-1	J	DTA114EK	AB
Q9105	VS2SC1815YW-1	J	TRANSISTOR	AC
Q9106	VS2SA988///1E	J	TRANSISTOR	AB
Q9107	VSDTC144EK/-1	J	DTC144EK	AB
Q9108	VS2SC1815YW-1	J	TRANSISTOR	AC
Q9109	VS2C1740SQR1E	J	TRANSISTOR	AC
Q9113	VSDTC124EK/-1	J	DTC124EK	AB
Q9114	VS2SC1815YW-1	J	TRANSISTOR	AC
Q9115	VSDTC124EK/-1	J	DTC124EK	AB
Q9116	VS2SC2412KQ-1	J	2SC2412KQ	AA

#### DIODES

D8909	VHD1SS119//1	J	1SS119	AB
D8930	VHD1SS119//1	J	1SS119	AB
D9001	VHDHVU17TRF-1	J	HVU17TRF	AE
D9045	RH-EX0630GEZZ	J	Zener Diode	AA
D9101	RH-EX0644GEZZ	J	Zener Diode	AB
D9102	RH-EX0617GEZZ	J	Zener Diode	AA
D9103	RH-EX0626GEZZ	J	Zener Diode	AA
D9104	RH-EX0648GEZZ	J	Zener Diode	AE
D9105	RH-EX0627GEZZ	J	Zener Diode	AA
D9107	VHD1SS119//1	J	1SS119	AB

Ref. No.	Part No.	★	Description	Code
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## PACKAGED CIRCUIT

X8930	RCRSB0168GEZZ	J	Crystal, 4.43MHz	AF
X8931	RCRSB0216GEZZ	J	Crystal, 3.58MHz	AG

#### COILS AND TRANSFORMERS

L8901	VP-XF390K0000	J	39μH	AB
L8910	VP-XF680K0000	J	68μH	AB
L8930	VP-2K101K000K	J	100μH	AB
L8931	VP-2K101K000K	J	100μH	AB
L9001	VP-ZK220K0000	J	22μH	AB
L9002	VP-ZK1R2K0000	J	1.2μH	AB
L9013	VP-XF100K0000	J	10μH	AB
L9060	VP-2K101K000K	J	100μH	AB
L9101	VP-2K470K000K	J	47μH	AB
L9102	VP-2K100K000K	J	10μH	AB
L9104	VP-2K470K000K	J	47μH	AB

#### CONTROLS

R8902	RVR-M4339GEZZ	J	33k (B)	AB
R8961	RVR-M4343GEZZ	J	100k (B)	AB
R8966	RVR-M4343GEZZ	J	100k (B)	AB
R9021	RVR-M4343GEZZ	J	100k (B)	AB
R9061	RVR-M4346GEZZ	J	220k	AB

#### CAPACITORS

C8901	VCCCCY1HH330J	J	33p 50V Ceramic	AA
C8902	VCCCCY1HH180J	J	18p 50V Ceramic	AA
C8903	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8904	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C8905	VCCCCY1HH151J	J	150p 50V Ceramic	AA
C8906	VCKYCY1HB681K	J	680p 50V Ceramic	AA
C8908	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8910	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8911	RTO-H1071GEZZ	J	50p Trimmer	AD
C8913	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8914	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8915	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8916	VCCCCY1HH390J	J	39p 50V Ceramic	AA
C8917	VCFYSA1HB334J	J	0.33 50V Mylar	AB
C8920	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8925	VCEAEA1HW474M	J	0.47 50V Electrolytic	AB
C8926	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8930	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8931	VCCCCY1HH8R0D	J	8p 50V Ceramic	AA
C8933	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8934	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8936	VCCCCY1HH6R0D	J	6p 50V Ceramic	AA
C8940	VCKYCY1AF105Z	J	1 10V Ceramic	AC
C8941	VCKYCY1AF105Z	J	1 10V Ceramic	AC
C8942	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8943	VCKYCY1AF105Z	J	1 10V Ceramic	AC
C8945	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA

Ref. No.	Part No.	★	Description	Code
<b>CAPASITORS (Continued)</b>				
C8947	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8950	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8955	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8960	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8962	VCKYCY1HB561K	J	560p 50V Ceramic	AA
C8963	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C8965	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8970	VCKYCY1CF104Z	J	0.1 16V Ceramic	AA
C8974	VCKYCY1HB391K	J	390p 50V Ceramic	AA
C8977	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C8980	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C8990	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C8992	VCKYCY1AF105Z	J	1 10V Ceramic	AC
C8993	VCCCCY1HH560J	J	56p 50V Ceramic	AA
C8994	VCEAEA1HW335M	J	3.3 50V Electrolytic	AB
C8996	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C8998	VCEAEA1AW107M	J	100 10V Electrolytic	AB
C9001	VCKYCY1HB102K	J	1000p 50V Ceramic	AA
C9002	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C9005	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C9006	VCKYCY1AF105Z	J	1 10V Ceramic	AC
C9010	VCEAEA1HW105M	J	1 50V Electrolytic	AB
C9011	VCCCCY1HH101J	J	100p 50V Ceramic	AA
C9013	VCCSD41HL560J	J	56p 50V Ceramic	AA
C9014	VCCSD41HL220J	J	22p 50V Ceramic	AA
C9015	VCKYD41HB102K	J	1000p 50V Ceramic	AA
C9045	VCE9EA1HW105M	J	1 50V Elect.(N.P.)	AC
C9046	VCEAEA1HW475M	J	4.7 50V Electrolytic	AB
C9050	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C9052	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C9060	VCCCCY1HH8R0D	J	8p 50V Ceramic	AA
C9062	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C9063	VCEAEA1AW107M	J	100 10V Electrolytic	AB
C9064	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C9065	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C9101	VCEAEA1EW476M	J	47 25V Electrolytic	AC
C9102	VCEAEA1AW107M	J	100 10V Electrolytic	AB
C9103	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C9104	VCEAEA1CW107M	J	100 16V Electrolytic	AC
C9105	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C9106	VCEAEA1CW107M	J	100 16V Electrolytic	AC
C9107	VCEAEA1CW476M	J	47 16V Electrolytic	AB
C9108	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C9109	VCEAEA1CW226M	J	22 16V Electrolytic	AB
C9110	VCEAEA1CW226M	J	22 16V Electrolytic	AB
C9111	VCEAEA1EW476M	J	47 25V Electrolytic	AC
C9113	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C9114	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C9115	VCEAEA1CW476M	J	47 16V Electrolytic	AB
C9116	VCEAEA1EW476M	J	47 25V Electrolytic	AC
C9117	VCEAEA1EW476M	J	47 25V Electrolytic	AC
C9118	VCEAEA1HW334M	J	0.33 50V Electrolytic	AB
C9119	VCEAEA1CW476M	J	47 16V Electrolytic	AB
C9120	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C9121	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB

Ref. No.	Part No.	★	Description	Code
<b>CAPACITORS (Continued)</b>				
C9122	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C9125	RC-EZ0458GEZZ	J	680 10V Electorolytic	AD
C9126	VCKYCY1EB103K	J	0.01 25V Ceramic	AA

**RESISTORS**

R8901	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R8903	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R8904	VRS-CY1JF335J	J	3.3M 1/16W Metal Oxide	AA
R8905	VRS-CY1JF563J	J	56k 1/16W Metal Oxide	AA
R8906	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R8907	VRS-CY1JF151J	J	150 1/16W Metal Oxide	AA
R8908	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA
R8909	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R8910	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R8913	VRD-RA2BE564J	J	560k 1/8W Carbon	AA
R8915	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R8917	VRS-CY1JF105J	J	1M 1/16W Metal Oxide	AA
R8918	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R8920	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R8921	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R8922	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R8923	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R8925	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
R8926	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R8927	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R8930	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R8931	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
R8932	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R8933	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R8934	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R8935	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
R8936	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
R8937	VRD-RA2BE222J	J	2.2k 1/8W Carbon	AA
R8945	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA
R8946	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA
R8947	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R8948	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R8950	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R8951	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R8955	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R8956	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R8957	VRS-CY1JF683J	J	68k 1/16W Metal Oxide	AA
R8958	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R8960	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R8962	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA
R8965	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R8967	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA
R8970	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R8974	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R8975	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide	AA
R8976	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R8977	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R8978	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R8979	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA

Ref. No.	Part No.	★	Description	Code
<b>RESISTORS (Continued)</b>				
R8981	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R8982	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R8985	VRS-CY1JF105J	J	1M 1/16W Metal Oxide	AA
R8991	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R8992	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R8994	VRS-CY1JF334J	J	330k 1/16W Metal Oxide	AA
R8995	VRD-RA2BE334J	J	330k 1/8W Carbon	AA
R8996	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA
R8997	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA
R9001	VRS-CY1JF331J	J	330 1/16W Metal Oxide	AA
R9002	VRS-CY1JF331J	J	330 1/16W Metal Oxide	AA
R9003	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R9004	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R9005	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R9006	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R9007	VRD-RA2BE471J	J	470 1/8W Carbon	AA
R9008	VRD-RA2BE561J	J	560 1/8W Carbon	AA
R9009	VRS-CY1JF105J	J	1M 1/16W Metal Oxide	AA
R9010	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R9011	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R9012	VRS-CY1JF470J	J	47 1/16W Metal Oxide	AA
R9013	VRD-RA2BE564J	J	560k 1/8W Carbon	AA
R9014	VRD-RA2BE564J	J	560k 1/8W Carbon	AA
R9016	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R9018	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R9030	VRS-CY1JF105J	J	1M 1/16W Metal Oxide	AA
R9031	VRS-CY1JF683J	J	68k 1/16W Metal Oxide	AA
R9032	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R9033	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R9034	VRS-CY1JF683J	J	68k 1/16W Metal Oxide	AA
R9035	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R9036	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R9045	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R9046	VRS-CY1JF124J	J	120k 1/16W Metal Oxide	AA
R9050	VRD-RA2BE101J	J	100 1/8W Carbon	AA
R9051	VRD-RA2BE101J	J	100 1/8W Carbon	AA
R9052	VRD-RA2BE101J	J	100 1/8W Carbon	AA
R9060	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R9062	VRS-CY1JF184J	J	180k 1/16W Metal Oxide	AA
R9063	VRS-CY1JF564J	J	560k 1/16W Metal Oxide	AA
R9065	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R9102	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R9103	VRD-RA2BE333J	J	33k 1/8W Carbon	AA
R9104	VRS-CY1JF563J	J	56k 1/16W Metal Oxide	AA
R9105	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R9106	VRD-RA2EE332J	J	3.3k 1/4W Carbon	AA
R9107	VRD-RA2EE332J	J	3.3k 1/4W Carbon	AA
R9108	VRS-CY1JF181J	J	180 1/16W Metal Oxide	AA
R9109	VRS-CY1JF181J	J	180 1/16W Metal Oxide	AA
R9110	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R9111	VRD-RA2BE470J	J	47 1/8W Carbon	AA
R9112	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R9114	VRS-CY1JF394J	J	390k 1/16W Metal Oxide	AA
R9115	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R9117	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA

Ref. No.	Part No.	★	Description	Code
<b>RESISTORS (Continued)</b>				
R9118	VRS-CY1JF824J	J	820k 1/16W Metal Oxide	AA
R9119	VRS-CY1JF824J	J	820k 1/16W Metal Oxide	AA
R9120	VRD-RA2BE124J	J	120k 1/8W Carbon	AA
R9121	VRS-CY1JF224J	J	220k 1/16W Metal Oxide	AA
R9122	VRS-CY1JF824J	J	820k 1/16W Metal Oxide	AA
R9125	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R9126	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
R9127	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R9128	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R9129	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R9130	VRD-RA2HD680J	J	68 1/2W Carbon	AA
R9131	VRD-RA2BE180J	J	18 1/8W Carbon	AA
R9132	VRD-RA2HD560J	J	56 1/2W Carbon	AA
R9133	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R9135	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R9136	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R9137	VRD-RA2BE472J	J	4.7k 1/8W Carbon	AA
R9138	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA

**MISCELLANEOUS PARTS**

P9101	QPLGN1178GEZZ	J	Plug, 11pin	AC
SC8901	QSOCN1894REZZ	J	Socket, 18pin	AD
TP8940	QPLGN0447REZZ	J	Plug, 4pin	AA

— End of LCD Unit —

**DUNTK5369XJ6B  
RELAY UNIT****CAPACITORS**

C2801	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C2802	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C2803	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C2804	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C2805	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C2806	VCKYCY1EB103K	J	0.01 25V Ceramic	AA

**RESISTORS**

R2801	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R2802	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R2803	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R2804	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R2805	VRS-CY1JF512J	J	5.1k 1/16W Metal Oxide	AA
R2806	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R2807	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA

— End of Relay Unit —

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
<b>MECHANISM CHASSIS PARTS</b>									
1	LBNDK1009GEZZ	J	Tension Band Ass'y	AT	47	NPLYV0155GEZZ	J	Motor Pulley	AR
2	LBOSZ1001GEZZ	J	Tension Arm Boss	AC	48	NPLYV0156GEZZ	J	Limiter Pulley Ass'y	AU
3	LBOSZ1002GEZZ	J	Slow Brake Boss	AR	49	NROLP0110GEZZ	J	Guide Roller	AH
4	LBOSZ1003GEZZ	J	Cassette Stay L	AR	50	NSFTP0034GEZZ	J	Tension Pole Adjust Cam	AA
5	LCHSM0158GEZZ	J	Main Chassis Ass'y	AY	51	PGUMM0043GEZZ	J	Damper Rubber	AB
6	LHLDZ1958GEZZ	J	Loading Motor Block	AR	52	PREFL1007GEZZ	J	Light Guide	AR
7	LPOLM0056GEZZ	J	Supply Pole Base Ass'y	AM	53	QCNW-7860GEZZ	J	FFC For Drum Motor	AE
8	LPOLM0057GEZZ	J	Take-Up Pole Ass'y	AM	54	QCNW-7501GEZZ	J	Lead Wire For Loading Motor	AD
9	MLEVF0459GEZZ	J	Take-Up Loading Arm Ass'y	AS	55	QCNW-7769GEZZ	J	FFC For Audio/Control Head	AF
10	MLEVF0461GEZZ	J	Supply Loading Arm Ass'y	AS	56	QPWBF5243GEZZ	J	Audio/Control Head PWB	AE
11	MLEVF0463GEZZ	J	Pinch Drive Lever Ass'y	AS	57	QSOCN0685REZZ	J	"Socket, 6 pin"	AB
12	MLEVF0464GEZZ	J	Pinch Roller Lever Ass'y	AW	58	RHEDT0031GEZZ	J	Full Erase Head	AH
15	MLEVF0467GEZZ	J	Tension Arm Ass'y	AS	59	RHEDU0085GEZZ	J	Audio/Control Head Ass'y	BA
16	MLEVF0468GEFW	J	Audio/Control Head Arm	AS	60	RMOTM1062GEZZ	J	Loading Motor	AP
17	MLEVP0271GEZZ	J	Sifter Drive Lever	AS	61	RMOTN2053GEZZ	J	Capstan Motor	BF
18	MLEVP0272GEZZ	J	Pinch Double Action Lever	AS	62	RMOTP1129GEZZ	J	Drum Drive Motor	BF
19	MLEVP0273GEZZ	J	Reverse Guide Lever Ass'y	AT	63	DDRMW0016HE01	J	Upper And Lower Drum Ass'y	BV
20	MLEVP0275GEZZ	J	Reverse Drive Lever	AB	64	MSPRC0194GEFJ	J	Drum Earth Brush Spring	AA
21	MLEVP0276GEZZ	J	Slow Brake	AS	65	QBRSK0034GEZZ	J	Drum Earth Brush	AD
22	MLEVP0277GEZZ	J	Open Lever	AS	66	XBPSD26P05J00	J	Drum Drive Motor Mounting Screw (SW2.6P+5S)	AA
23	MLEVP0278GEZZ	J	Clutch Lever	AS	67	PGIDC0055GEFW	J	Drum Base	AL
24	MLEVP0279GEZZ	J	Supply Main Brake Ass'y	AS					
25	MLEVP0280GEZZ	J	Take-up Main Brake Ass'y	AS					
26	CLEVP0287GEZZ	J	Auto Head Cleaner Ass'y	AF					
27	MSLIP0008GEZZ	J	Sifter	AS					
28	MSPRC0205GEFJ	J	Audio/Control Head Spring	AR					
29	MSPRD0165GEFJ	J	Reverse Guide Spring	AR					
30	MSPRT0402GEFJ	J	Loading Double Action Spring						
31	MSPRT0403GEFJ	J	Pinch Double Action Spring	AR					
33	MSPRT0405GEFJ	J	Tension Spring	AR					
34	NBLTK0066AJ00	J	Drive Belt	AE					
35	NDAIV1070GE00	J	Reel Disk	AS					
36	NGERH1267GEZZ	J	Loading Connect Gear	AS					
37	NGERH1268GE00	J	Master Cam	AS					
38	NGERH1269GEZZ	J	Cassette Control Drive Gear	AS					
39	NGERH1270GEZZ	J	Take-Up Loading Gear	AF					
40	NGERH1271GEZZ	J	Supply Loading Gear	AS					
41	NGERH1272GEZZ	J	Pinch Drive Cam	AS					
42	NGERH1275GEZZ	J	Supply Reel Relay Gear	AS					
43	NGERH1276GEZZ	J	Take-Up Reel Relay Gear	AS					
44	NGERW1062GEZZ	J	Worm Gear	AS					
45	NGERW1063GEZZ	J	Worm Wheel Gear	AS					
46	NIDR-0015GEZZ	J	Idler Wheel Ass'y	AS					

— End of Mechanism Chassis Parts —

Ref. No.	Part No.	★	Description	Code
<b>CASSETTE HOUSING CONTROL PARTS</b>				

300	CHLDX3074GE02	J	Cassette Housing Control Ass'y	AZ
301	LANGF9592GEFW	J	Upper Plate	AT
302	LHLDX1028GE00	J	Frame (L)	AS
303	LHLDX1029GE00	J	Frame (R)	AS
304	LHLDX1030GEZZ	J	Holder (L)	AR
305	LHLDX1031GEZZ	J	Holder (R)	AR
306	MLEVF0469GEFW	J	Proof Lever (R)	AS
307	MLEVP0281GE00	J	Door Open Lever	AS
308	MSLIF0073GEFW	J	Slider	AT
309	MSPRD0151GEFJ	J	Proof Lever (R) Spring	AB
310	MSPRD0166GEFJ	J	Drive Gear (R) Spring	AR
311	MSPRP0159GEFJ	J	Cassette Spring	AD
312	MSPRT0381GEFJ	J	Double Action Spring	AB
313	NGERH1278GEZZ	J	Drive Gear (L)	AS
314	NGERH1279GEZZ	J	Drive Gear (R)	AS
315	NGERR1008GE00	J	Double Action Rack Gear	AS
316	NGERR3005GEFW	J	Drive Angle Gear	AS
317	NSFTD0041GEFD	J	Main Shaft	AF

Ref. No.	Part No.	★	Description	Code
<b>SCREWS, NUTS AND WASHERS</b>				
200	LX-XZ3030GEFD	J	Set Screw	AC
201	LX-BZ3176GEZZ	J	Tilt Adjusting Screw	AD
202	LX-HZ3082GEZZ	J	Audio/Control Head Screw	AD
203	XHPSD26P06000	J	Screw, C2.6P+6S (For Capstan Motor)	AA
204	XBPSD30P05J00	J	Screw, SW2.6P+5S (For Loading Motor)	AA
205	XHPSD26P06WS0	J	Screw, C2.6P+6S (For Loading Motor Block)	AA
206	XHPSD26P08WS0	J	Screw, C2.6P+8S (For F/E Head)	AA
207	XHPSD30P08WS0	J	Screw, C3.0P+8S (For Drum Base)	AA
208	XRESJ40-06000	J	E-Ring, E-4	AA
209	XWHJZ52-05095	J	Washer, W5.2-9.5-0.5 (Reel Hight Adj.)	AD
210	XWHJZ52-03095	J	Washer, W5.2-9.5-0.3 (Reel Hight Adj.)	AD
211	XWHJZ52-04095	J	Washer, W5.2-9.5-0.4 (Reel Hight Adj.)	AD
212	XWHJZ52-06095	J	Washer, W5.2-9.5-0.6 (Reel Hight Adj.)	AD
213	XWHJZ52-07095	J	Washer, W5.2-9.5-0.7 (Reel Hight Adj.)	AD
214	PSPAP0009GEZZ	J	Reverse Guide Adjusting Nut	AA
215	LX-WZ1003GE00	J	Cut Washer	AA
216	LX-WZ1041GE00	J	Cut Washer	AA
217	LX-WZ1073GE00	J	Cut Washer	AB
218	XBPSD30P08J00	J	Drum Base Mounting Screw (SW3P+8S)	AA

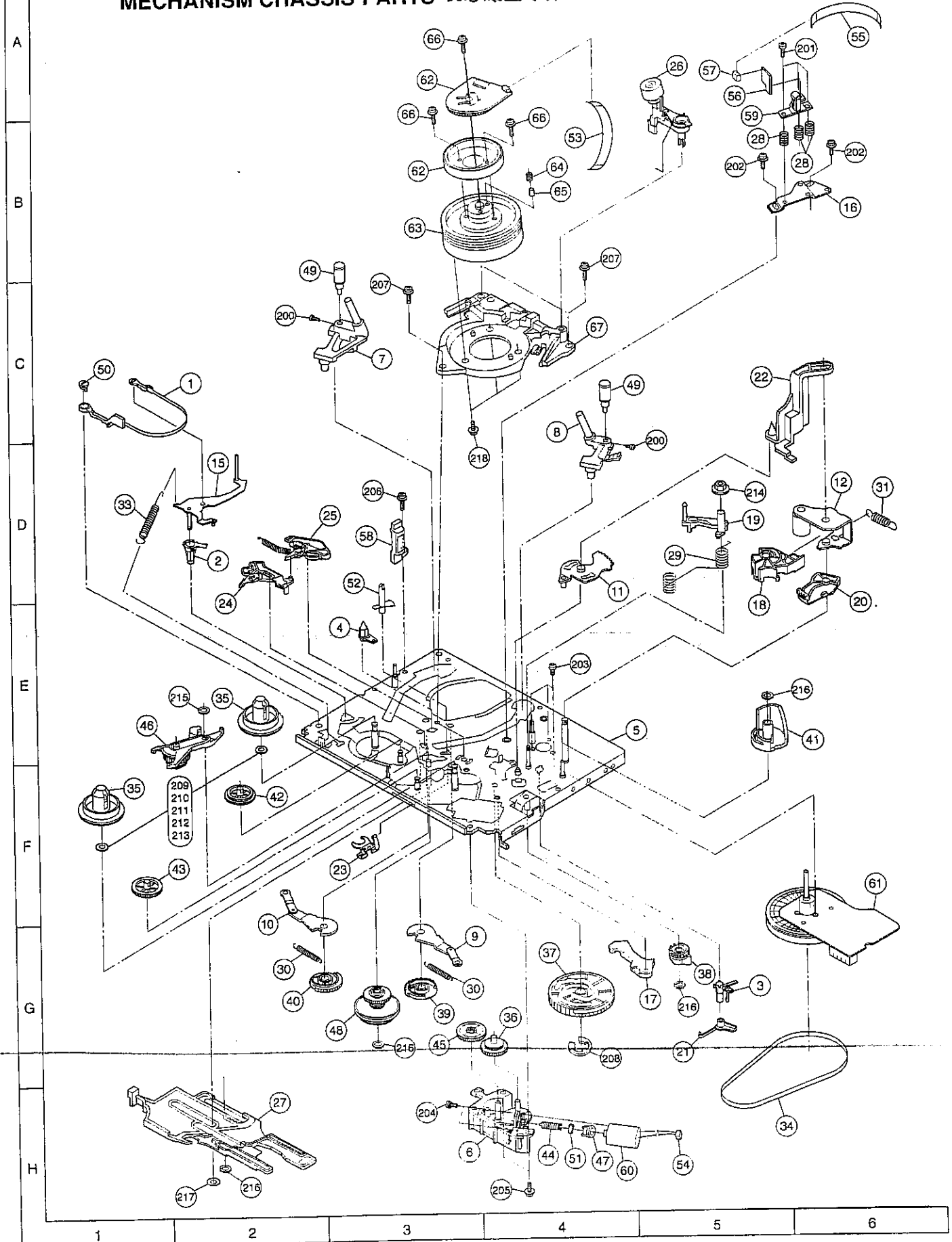
— End of Cassette Housing Control Parts —

— End of Screws, Nuts And Washers —

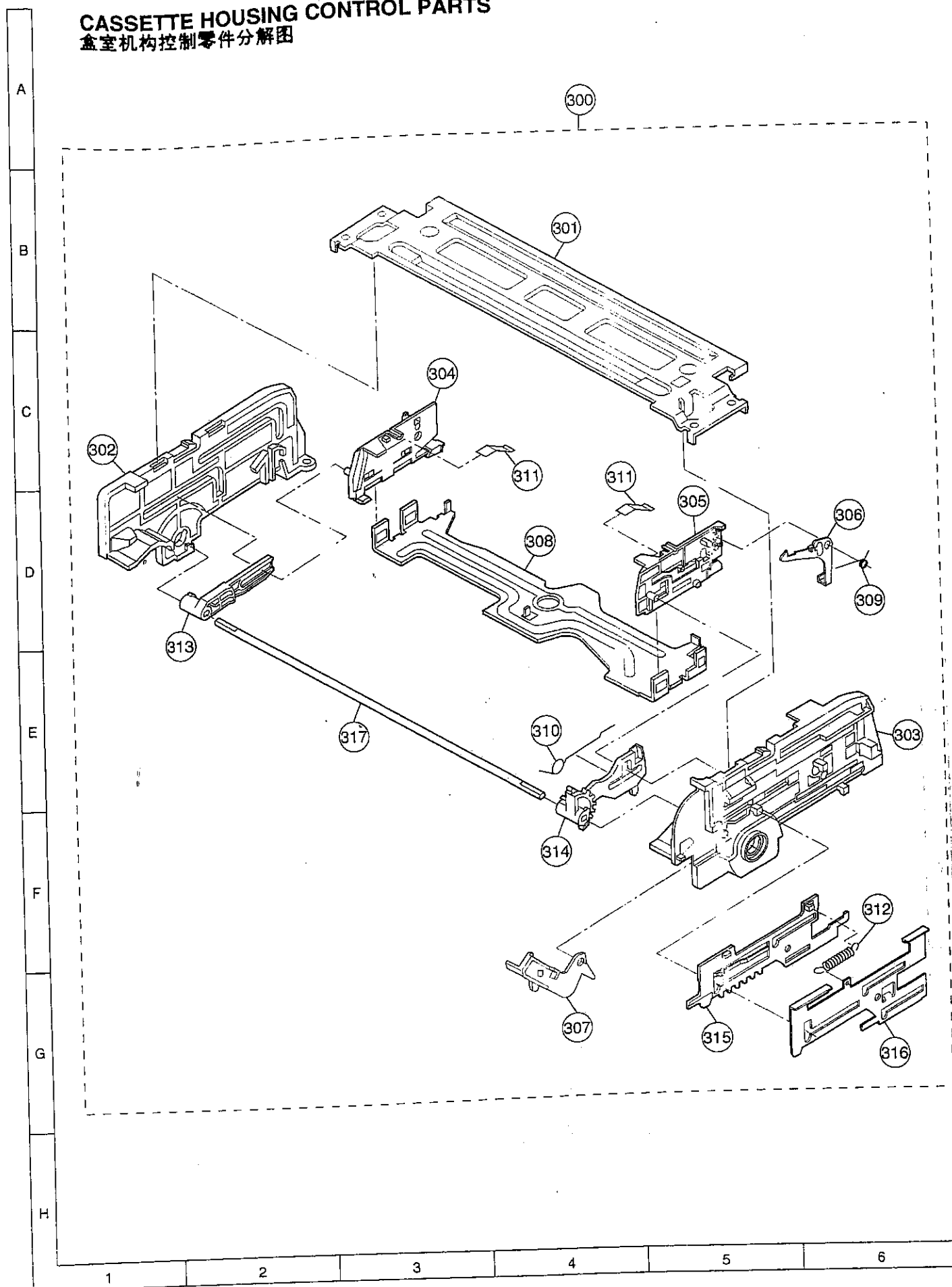


Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
<b>MECHANICAL PARTS</b>					518	JKNBK1097GES	J	Dial	AE
600	GCABA3109GESF	J	Top Cabinet	AU	519	JKNBK1098GES	J	Volume Knob	AD
601	GBDYU3099GEZZ	J	Bottom Plate	AK	<b>End of Front Panel Parts</b>				
602	GCABB1175GEZZ	J	Main Frame	AT	<b>LCD UNIT PARTS</b>				
603	GCOVA2019GEZZ	J	Antenna Terminal Cover	AD	520	CCOVA1997GE01	J	LCD Cover Ass'y	AM
606	LANGK0165GEFW	J	Top Cabinet Angle	AC	520-2	QEARP0422GEZZ	J	LCD Earth	AB
607	LANGK0171GEFW	J	Top Cabinet Angle (R)	AE	521	CHLDZ1982GE01	J	PWB Holder Ass'y	AE
609	LHLDZ1972GEZZ	J	Main PWB Holder	AE	521-1	LHLDZ1982GEZZ	J	PWB Holder	AF
610	LHLDZ1988GEZZ	J	Frame Holder	AG	521-2	QEARP0423GEZZ	J	Inv. Earth	AA
611	LX-HZ3047GEFF	J	Screw	AA	522	GCOVA1996GEZZ	J	LCD Case	AD
612	LHLDZ1990GEZZ	J	Hi-Fi PWB Holder	AG	523	LHLDZ1981GEZZ	J	LCD Holder	AK
616	PSPAZ0535GEZZ	J	Top Cabinet Spacer	AD	525	CLMPV0019TA02	J	Lamp Unit	BA
618	LHLDZ1089GE00	J	TIMER/REC LED Holder	AA	526	PMIR-0018TAZZ	J	Mirror	AD
623	LX-HZ3040GEFF	J	Screw	AA	527	PGIDM0023TAZZ	J	Light Guide	AK
624	XEBSD30P12000	J	Screw	AA	528	PSHEP0025TAZZ	J	Sheet	AF
625	XHPSD30P06WS0	J	Screw	AA	530	RLCDV0002GEZZ	J	Display	BX
626	XHPSD30P08WS0	J	Screw	AA	531	XEBSD30P14000	J	SCREW	AA
627	XEBSD40P12000	J	Screw	AA	532	XEPSD20P06000	J	SCREW	AA
628	XESSF30P12000	J	Screw	AA	533	XEPSF30P08000	J	SCREW	AA
629	LHLDZ1092GEZZ	J	PWB Holder	AD	534	XEPSF30P10000	J	SCREW	AA
630	PSLDM4525GEFW	J	Shield Case	AF	536	CANGF9605GE01	J	LCD Unit Angle	AT
631	QCNW-7857GEZZ	J	Earth Cord	AC	538	QCNW-7848GEZZ	J	FFC Cable	AC
<b>End of Mechanical Parts</b>					<b>End of LCD Unit Parts</b>				
<b>FRONT PANEL PARTS</b>					<b>SUPPLIED ACCESSORIES</b>				
500	CPNLC2192GE01	J	Front Panel Ass'y	AZ	<b>ACCESSORIES</b>				
501	CBTN-2765GE01	J	Power Button Ass'y	AG	QCNW-2702GEZZ	J	75ohm Coaxial Cable	A	
501-2	GCOVA1992GEZZ	J	Power LED Cover	AD	QCNW-7581GEZZ	J	AV Cable	A	
502	CDORF2243GE01	J	Door Ass'y	AV	RRMCG0162AJSA	J	Infrared Remote Control Unit	A	
502-1	GCOVA2015GESB	J	Door Cover	AM	93GHR19472001	J	Battery Cover, Infrared Remote Control Unit		
502-3	HBDGD1003GES	J	SHARP Badge	AH	<b>ACCESSORIES (NOT REPLACEMENT ITEM)</b>				
502-4	LANGF9484GE00	J	Magnet Angle	AC	TINS-3040GEZZ	-	Operation Manual		
502-5	PSPAG0019GEZZ	J	Spacer	AA	<b>End of Supplied Accessories</b>				
502-6	XESSF20P06000	J	Screw	AA					
503	GCOVA1993GEZZ	J	Timer/Rec Decoration	AE					
504	GCOVA1994GEZZ	J	R/C Cover	AE					
505	HDECQ1576GES	J	Cassette Flap	AH					
506	HDECQ1507GES	J	Foot Dec.(R)	AD					
507	HDECQ1508GES	J	Foot Dec.(L)	AD					
509	JBTD-2766GES	J	CH Button	AE					
510	JBTD-2767GESE	J	Rec Button	AE					
511	LHLDZ3041GEZZ	J	Magnet	AD					
512	MSPRD0103GEFJ	J	Cassette Spring	AB					
513	MSPRP0179GEFW	J	Door Spring	AF					
514	CBTN-2776GE03	J	Play Button Ass'y	AH					
514-2	JBTD-2777GESD	J	Stop/Pause Button	AE					
514-3	LHLDZ1974GEZZ	J	Button Holder	AE					
515	LANGF9604GEFW	J	LCD Angle	AK					
516	XEBSD30P14000	J	Screw	AA					
517	XEPSF30P10000	J	Screw	AA					

# 11. EXPLODED VIEW 零件分解图 MECHANISM CHASSIS PARTS 机芯底盘零件分解图

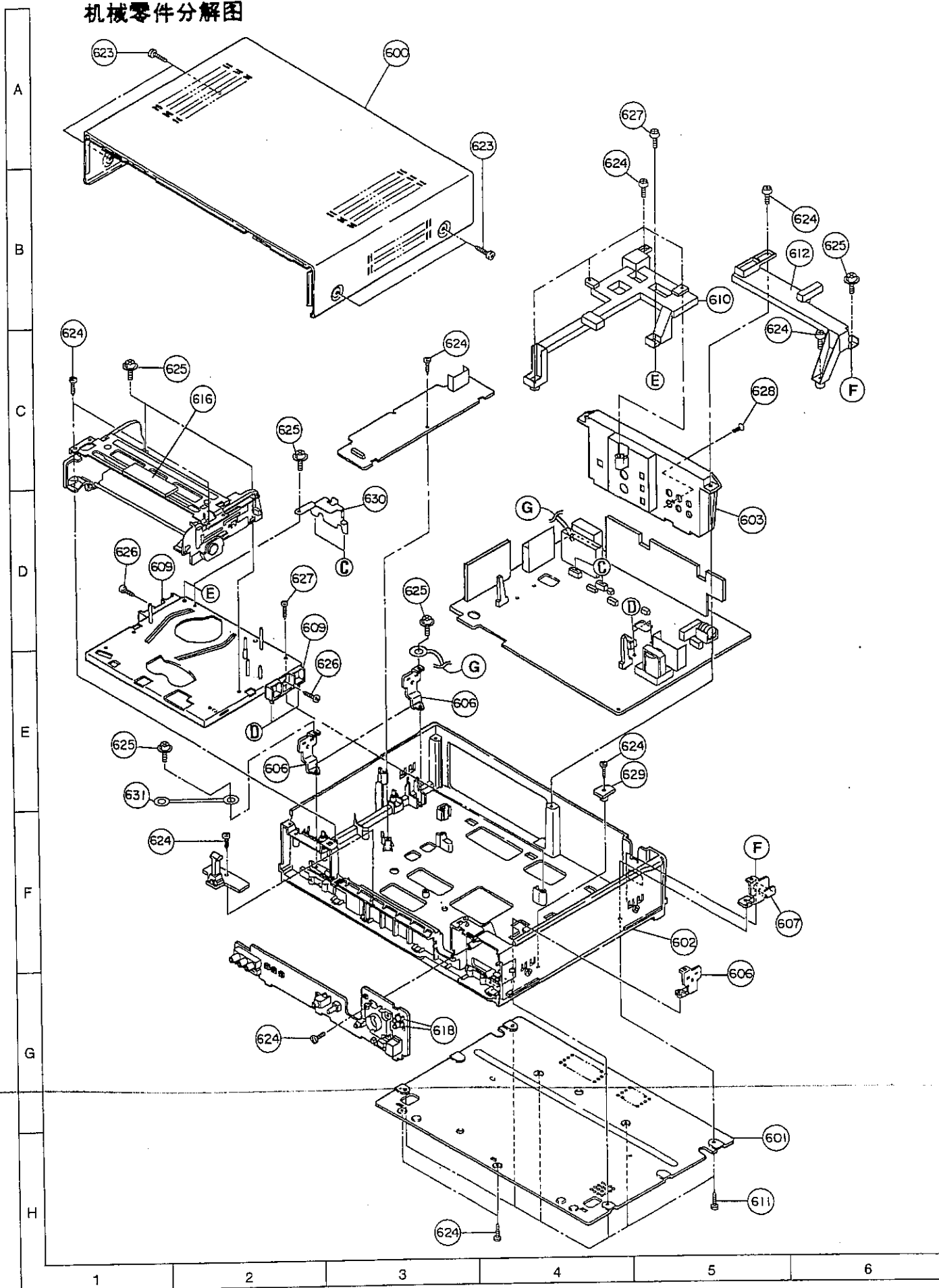


# CASSETTE HOUSING CONTROL PARTS 盒室机构控制零件分解图

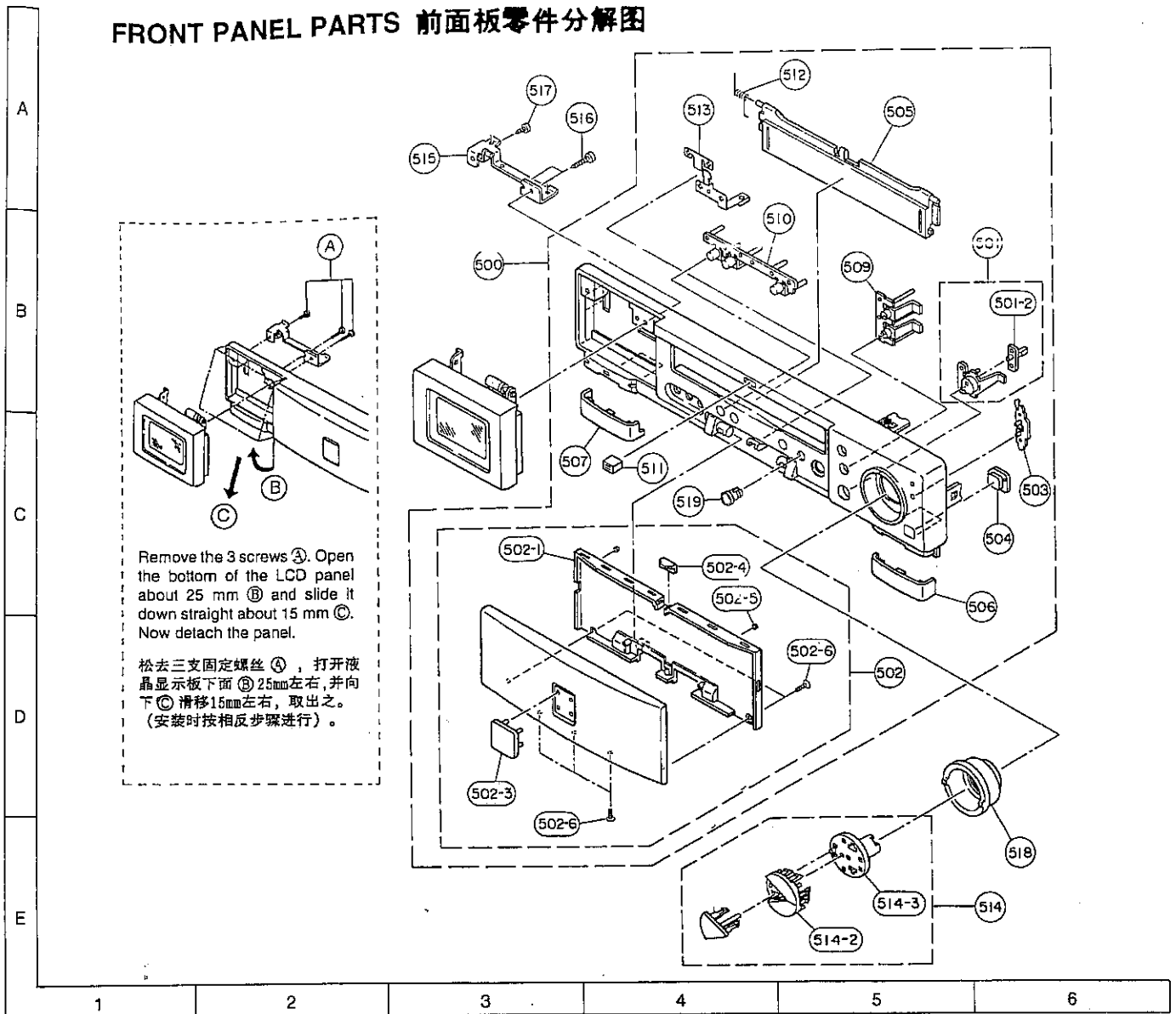


VC-ML3  
VC-ML3W

# MACHICAL PARTS 机械零件分解图

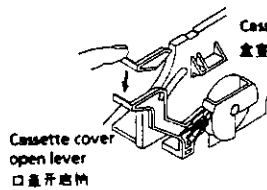


# FRONT PANEL PARTS 前面板零件分解图



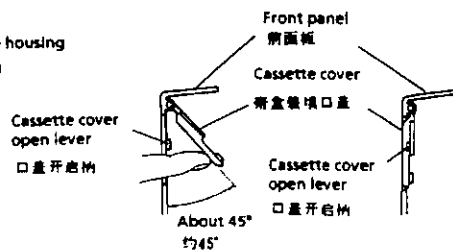
## PRECAUTIONS ON FRONT PANEL SET-UP

### 前面板装配时的注意事项



Before attaching the front panel in position, make sure that the cassette cover open lever is in its right place (lowermost). If it is out of position, push it down with a finger.

安置前面板就位之前，必须先检查口盖开启杆是否置于正当位置（最下位置），否则，用手指向下按压口盖开启杆。

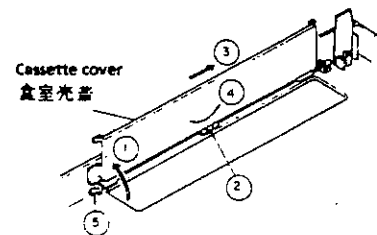


Keep the cassette cover about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place.

保持将带盒槽口盖开启度为约45°的状态，然后确认口盖开启杆位于前面板与带盒槽口盖之间，这样便可将前面板安装在定位位置上。

Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette

带盒槽口盖开启度过大时，切勿安装前面板，否则带盒槽盖套于盒室机构内时，会导致其口盖开启动作不当。



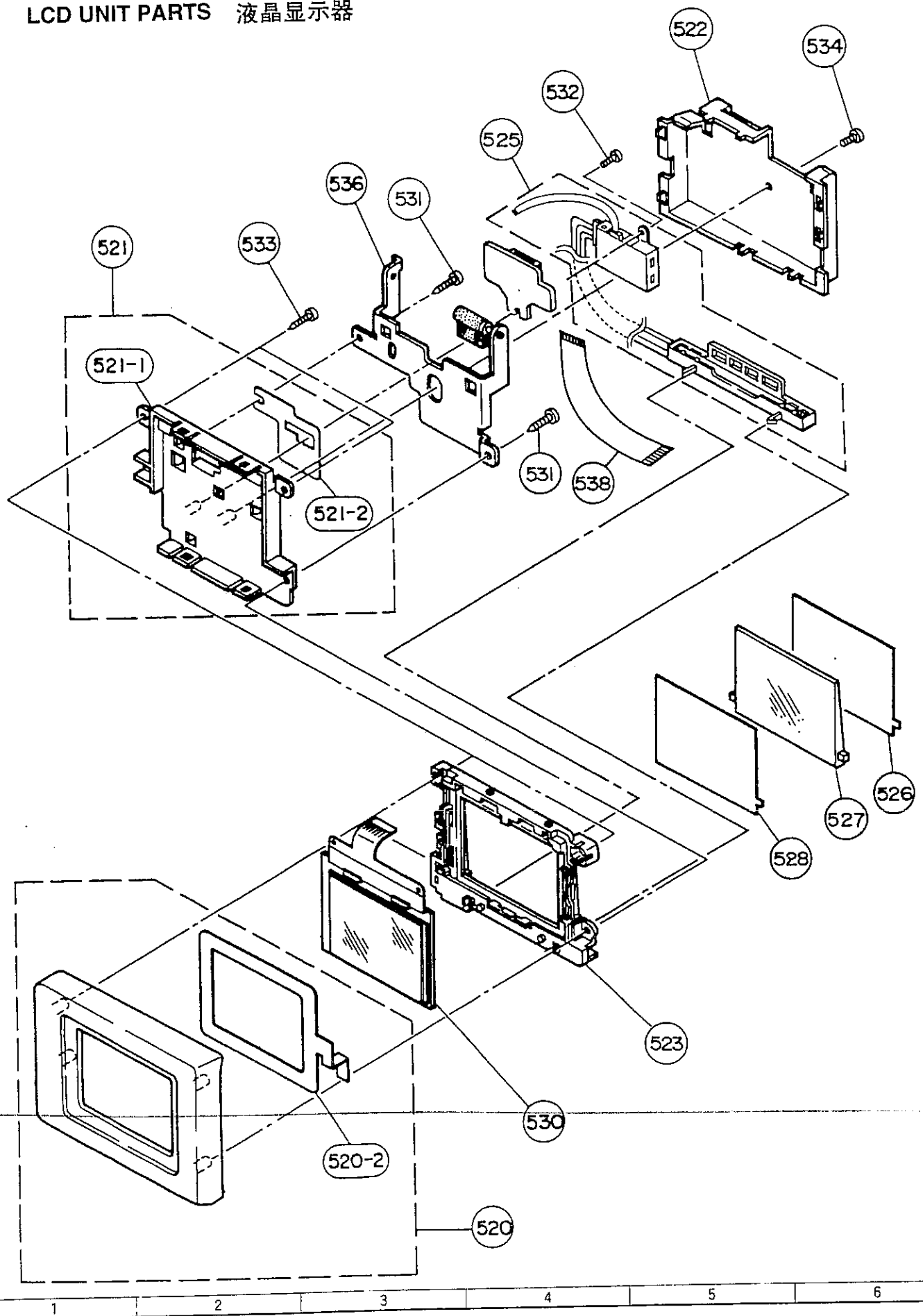
Removing the cassette compartment cover.

- ① Open the cassette compartment cover fully.
- ② Remove the center positioner.
- ③ Slide the cover to the right.
- ④ Slightly bend the cover.
- ⑤ Draw out the left-side rod.

盒室壳盖的拆除

- ① 完全打开盒室壳盖。
- ② 拆下中心位置控制器。
- ③ 向右侧移动盒室壳盖。
- ④ 稍微把盒室壳盖倾斜。
- ⑤ 取出左侧杆。

LCD UNIT PARTS 液晶显示器



## 12. PACKING OF THE SET 包装方法

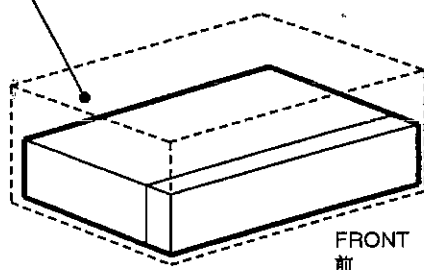
## • Setting position of the Knobs • 各旋钮设定方法

RF Converter (HONG KONG) 射频变换器 (香港)	at "E36" position 频道为 "E36"	RF Converter (SINGAPORE) 射频变换器 (新加坡)	at "E39" position 频道为 "E39"
System Switch 系统开关	at "B/G, I, D/K" position "B/G-I-D/K" 位置	Test Signal Switch 测试信号开关	at "OFF" position "OFF" 位置

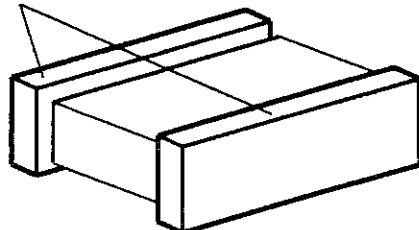
## Accessories ★ 附属品

- ★ TINS-3040GEZZ Operation manual  
使用说明书
- QCNW-2702GEZZ 75 ohm coaxial cable  
天线延长引线
- QCNW-7581GEZZ AV cable  
AV延长引线
- Battery  
干电池

- ★ SPAKP0084GEZZ  
Polystyrene sack  
聚苯乙烯薄膜袋



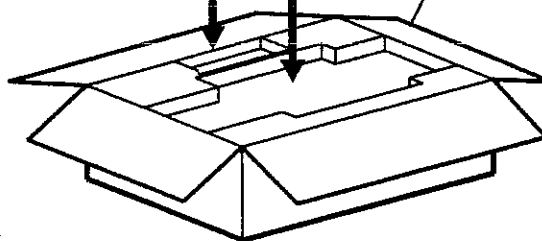
- ★ SPAKX0982GEZZ  
Buffer material  
防震泡沫塑料衬垫



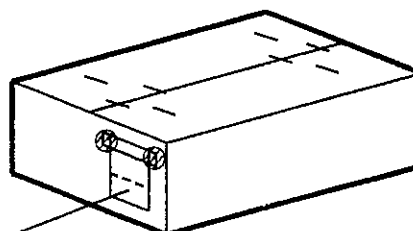
RRMCG3040AJSA  
Infrared remote control unit  
红外线遥控器

- ★ SSKA0003GEZZ  
Polystyrene sack  
聚苯乙烯薄膜袋

- ★ SPAKC3383GEZZ (VC-ML3)
- ★ SPAKC3382GEZZ (VC-ML3W)
- Packing case  
包装用纸箱



- ★ TLABK3425GEZZ (VC-ML3)
- ★ TLABK3424GEZZ (VC-ML3W)
- No. card  
出厂编号标签



★ Not Replacement Items  
★ 记号者为非更换品目

VC-ML3  
VC-ML3W

**SHARP**

TQ0148-S  
Printed in Japan  
在日本印刷